SUPPLEMENT.

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FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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Original Correspondence.

AN AMERICAN'S VIEW OF THE TIN MINES OF CORNWALL.

A visit to the tin mines of Cornwall by an American interested in mining affairs is a labour of love, undertaken with the highest anticipations—mines wrought anterior to the Roman invasion, the chief deposit of a metal longest known to man, furnishing to the commerce of the world 10,000 tons annually. Tradition and modern fact unite here in furnishing a Mecca for the miner. In addition to this, the Cornish expert has gained a world-wide reputation, causing him to be accepted as the surest reliance for works of exploitation wherever discovery opens new fields for mining enterprise. The four great forces commonly used in operative mining—the handicraft in extraction, the engine, the pump, and the crusher—have each gained distinctive celebrity by a Cornish paternity. Every text-book and treatise on mining economics illustrate theories by citing Cornish practice, and furnish examples of results sanctified by ages of Cornish experience. As Swansea has become the focal of authority in the work of reduction so, too, has Cornwall established high reputation in the work of production.

From London a rich country is traversed 328 miles to Penzance, and many cities passed, all noted for wealth, commerce, and large populations. The railway from Exeter to Devonport and beyond exhibits the grandest achievements of brain and capital. Here rocky slopes are walled up and girdled, precipitious cliffs subdued—there the bastian flanks of mountains, self-fortified against the battering assaults of ponderous waves, are penetrated, and the ocean itself driven back, or the blows of its powerful battery deadened short of their destructive aim. Every train may be likened to a triumphant procession, cheerfully recognised by the clattering echoes from mountain gorge and rocky embattlements, and acknowledged, too, more sullenly by the surging waves, as they break harmless and crestfallen against abutment walls.

The landscape is a varied panorama of water, hill, and valley, garden fields, and primitive forests; the latter now civilised into splendid parks, famous as dukedoms and earl domains, turreted castles, and linked with the history of a thousand years of human progress. The eye that a moment since had gazed upon the turbulent ocean, the bridged estuary, and placid bay, where ships rode at anchor and fishing-boats gathered in the spoils of a thrifty net, now ranges over a pastoral mosaic, luxuriant plots fringed with vegetating walls of stone, and traversed by winding streams, gleaming brightly through marginal bushes and stately trees; within them here a lazy flock of sheep, all fatalists, seemingly content to fatten for mutton-chops and woolly fleece, a short-lived, peaceful, browsing being their lot; there a more sprightly herd of cattle, proud of their breed, and would be more defiant did they know the fate of their sirloin, hide, and tallow; near by a bevy of horses, ready to scent a frolic in the air, enjoy a sham contest on the sod, and seemingly wise enough to forecast triumphs on the course, changing sovereigns by leaps or speed, or by drafting the commerce of the world. So on to Cornwall, where the hills are more lofty, the valleys more pinched, and the landscape crowded with huge piles of rock, strange to the surface, or high mounds of debris brought up with the emboweled wealth of subterranean drifts. Here a Cornish engine, enclosed in walls, monumental as if of a fistic contest, the index finger pointing upwards; there the winding-wheel and lofty gear, below the iron skeleton and ponderous hammers, which rise and fall in turbulent battery, the clattering din of mining thrift and metalliferous wealth.

Thus Penzance is reached—a silent, steadfast, sturdy town, built as if to challenge endurance with the adjacent hills—a solid town and a steady-going people, who are best known to the distant world as dwellers near the "Land's End," hence *ne plus ultra*ites, never laughing unless tickled with Cornish straws, and won't sneeze unless aggravated by Cornish snuff. The surroundings are picturesque, even magnificent, three-fourths encircled by the ocean, granting a stretch of view grand and imposing, whilst on the land there are garden plots and thrifty fields redeemed from barren wastes of rocks and stones, which have been economised in fencing, sodded and moss-grown on the coping. Residences there are which bespeak the wealth obtained from the adjacent mines.

A ride of seven miles over a thoroughly good road brings you to St. Just—a parochial district and a mining centre. The houses of the workpeople, the offices of superintendents and agents, have the solemn, solid air of comfort and stability, fixed, finished, and unalterable. All else, on first view, seems a ruin and a wreck—machinery without a roof, hoisting gear without cover, shaft-houses looking as if extemporised after a hurricane which left none but broken posts and shattered boards—all out of doors cheerless, unpromising, only showing life by a ricketty clatter of stamps, the rattle of stones and sludge from skips, shot down from infirm galleries—these attended by slow-moving men stiffened by exposure, drenched by rain, and working as if it had to be done rather than that it ought to be. This was the Cornish Mecca of my imagination.

The Boscaswell Downs Mine.—Possessing a letter of introduction to the managing agent, Mr. Williams, I was kindly permitted to enter the mine and go over all the works of the company, and very cheerfully furnished all facts and information valuable to a stranger. In the same district are located the old and celebrated Royal mine of Botallack, The Levant, North Levant, St. Just Amalgamated, St. Just United, Balleswidden, and others. The Boscaswell is among the most ancient and most extensively worked. The deepest shaft is over 200 fms.—1200 ft. Some 20 levels have been run, some to the extent of ½ mile. Active operations have been carried on over 100 years. The profits of a modern period reach the sum of 300,000*l*. Several spurs have been slightly followed, which indicated valuable deposits of metal; parallel courses, or lodes, have also been found and prospected from the surface; these have proved rich enough to warrant cross-cuts from the deeper levels in the main lode, which will speedily develope those that prove valuable. The upper works consist mainly of one Cornish pumping-engine, two stamp-mill engines, each running 36 stamp-heads, and three winding-engines, two of which are of modern construction—the portable engines manufactured by Messrs. Robey and Co., of Lincoln. There are upwards of 300 men employed underground and on the surface. Nearly all the underground work is set at either tribute or contract, also a considerable portion of the surface work. The day workers are supervised by the agents. There are also two tin-washing buildings, and the multifarious apparatus and fixtures for concentrating out the tinstuff. These are close by the stamping-batteries, and receive the flowing pulp as the rock is crushed.

It would be a superfluous task to enter into any detail of the mine. Its reputation and permanence as a metalliferous lode is quite sufficiently proved by the work of a century, and the production of immense sums of money in the past. The walls solid granite, the crevice seldom 3 ft. (oftener less than 2 ft.), irregular in pitch, a selvage or gouge between the vein deposit and the hanging wall, here and there large bunches of clay-slate, in which the sulphides and arsenides of copper and iron are in association with the tin, and often with wolfram. A very considerable part of the vein matter is decomposed disintegrated slate, silex, and oxide of iron, which when broken down becomes sludge with the dripping water of the mine. In consequence of this rottenness very little blasting is required, the most yielding to the pick and the gad. The stuff, sent up in skips, is, perhaps, 40 per cent. of sludge to 60 per cent. of firmer material,

The shafts, of which there are three on the main lode (two hoisting and one for the pump), all deep, are without timbering. The simplest and rudest form of ladder-ways serve for ingress and egress, and as rude and as primitive ways, slides are furnished for the loaded skip. Water is made in very considerable quantities, and no means provided to prevent dripping from the walls and cross ties of the shaft and ladder-ways. A rain of mud and sludge increases in quantity as you descend.

The hoisting rig is mostly of Cornish sanction, unchangeable by any improvements made elsewhere during the last century. But at the Boscaswell a dreadful innovation has been successfully introduced. A wicked combination of devices, not of Cornish paternity, and in defiance of the scoffs, jeers, lugubrious prophecies, has been introduced, and, *mirabile dictu*, it succeeded—actually brings up a Cornish skip, over a Cornish slide, filled with Cornish ore, which hitherto has only been done by a Cornish engine, just fixed so and so. This audacious contrivance actually dares to consume only one-quarter the amount of coal hitherto required, accomplishing the same work in two-thirds of the time—and "won't bust!" The Cornish engineers, of Cornish infallibility, await *that bust*, intending then to visit the ruins, each carrying a banner—"I told you so!"

The stamp-mill is of Cornish pattern and Cornish arrangement, placed all out of doors, perhaps to harden the *calithumpsian* monstrosity, and induce activity among the attendants, so as to get back to cover from the wind and rain. The ore is dumped into bins behind the battery, and mainly fed by water, since that means is the most irregular, and best suited to the irregularity of the thumpety-thumping it is to get as it passes through the coffers. Ingenuity exhaust itself in keeping the thing in repair. Human muscle and endurance being cheap, coal abundant, though dear, water free, and eternity full of time, this contrivance is deemed sufficiently perfect to render all attempts to supplant it by more modern construction one of the "I told you so's."

The washing-floors are mud flats covered with a roof, partially boarded on the sides, with large openings not always fitted with doors or windows. Here are buddles, concave and convex, launders innumerable, slime pits and coffers, tossing-tubs and keeves, frames and thumpers, shovels, scrapers, and slush everywhere. Men and women, boys and girls do the work, and escape insanity because they know nothing but the names of the things and the routine; an attempt to understand the *rationale* of the proceedings would end in dementation. Repetitions, divisions, redoing and undoing, shovelling and reshovelling, putting in and taking out, tossing and "framing," here a little and there a little, *ad infinitum*. The process is something like the chimney conundrum—"Patch upon patch and a hole in the middle," guess what it is? At the end of this labour of Sisyphus—rolling a huge stone up a high hill which ever rolled back again—the tinstuff is finally ready to be sent to smelter.

Tin Smelting.—There are five smelting establishments in and about Penzance, three of which are owned or controlled by Messrs. T. S. Bolitho and Co. The very obliging manager of one furnished every desired information, and kindly permitted a view of the works. After weighing the tinstuff, brought in long slender bags of about 250 lbs. contents, the product is sampled and assayed for two purposes—the quantity of metal and the quality. Some mines produce tin of a finer, or rather more easily refined into tin of the best quality. Three grades of metal are produced—one for the dyer's use, one for the tin-plate worker, one for common alloyage, such as solder. When the ores are thus classified they are mixed with one-fifth to one-eighth in weight of powdered anthracite, then damped and introduced into the common reverberatory furnace. The coal is said to be used for a flux, whereas the chemical effect is that of abstracting the oxygen from the dioxide of tin speedily at a low heat, whilst a higher heat unites the iron and silica, forming a silicate of iron on the top of the already deposed tin. If the iron is not in sufficient quantity to absorb all of the silica, lime has to be added for the surplus. The fluid impure metal is then run from under the scoria and ladled into large moulds. These blocks are again melted in another furnace at a low temperature, which causes the tin to float upon the heavier impurities, which subside to the bottom. The tin is again run off into moulds. These are then placed in a large cauldron of iron, heated from below; into the liquid metal green wood is submerged by force. The heat rapidly evolves steam and other gases, causing the liquid mass to bubble and become turbulent with internal commotion, serving to thoroughly mix and cast to the surface all the impurities remaining. When this is sufficiently done the metal is ladled out into moulds, stamped, and piled up for the market. The slag and scoria are sorted, crushed, and repeatedly washed for metallic tin. The heavy impurities obtained from the bottom of the second furnace are picked over for attached particles of tin, and then sold by weight at a low price per ton. Until lately these blocks were given away for ballasting.

The Tinstuff.—The ore when brought to grass contains about an average of 1 per cent. of pure metal to the ton—20 lbs. out of 2000. The tinstuff as washed and delivered to the smelter is about 33 lbs. to the 2000, the surplus consisting of oxygen, and the impurities still clinging to the dioxide of tin. The average of 80*l*. per ton is paid for the tinstuff. Hence it will be seen that 100 tons of average ore is worth about 130*l*. as it comes from the mine—26s. per ton=$6·50. The ore is broken by hammers when it falls from the skip, the copper nodules selected out, and the bulk sent on to the stamps. This copper ore, in small quantity, is sold for copper. A portion of the pulp, after first washing, is reserved for roasting for the elimination of the sulphur—a ferric oxide and a cupric sulphate. The latter is mainly wasted. Means are now taken at the Boscaswell to precipitate metallic copper from this sulphate.

Production.—The present production of the Boscaswell is from 70 to 80 tons per day, the limit of the crushing capacity. This property has come under the present management during the present year, burthened with all the conditions of the past system of working—the patchwork of a century, the old never abandoned, only added to by a new turn or genuflexion adapted to the fixed order of things. With an incongruous system, exposed machinery, naked shafts, and a higgeldy-piggeldly scatteration of appliances, also, came a non-disciplined demoralised system of labour, accustomed to abuses which had obtained the sanction of habits, hence deemed legitimate. To fracture the crust of stolid conventionalities by the introduction of new machinery and a more disciplined system of labour is no easy undertaking, and never a popular one in a self-opiniated community. When abuses have grown into even criminal practices it is difficult to set up a higher moral standard. This has, however, been commenced in both respects. A new engine, boiler, and winding apparatus now supplies the place of the Cornish pet, at less than two-thirds the cost of plant, and at a saving of about 1*l*. per day, doing the same work in about two-thirds the time. Other innovations in machinery are to follow—modern stamps, and perhaps a remodeling of the washing devices. All to be housed, systematised, and under a careful discipline, precisely as if the workmen were to to be considered no longer only as hired beasts needing no shelter, and incapable of appreciating a proper care for their comfort and physical well-being.

That the labourers object to this solicitude in their behalf, accompanied, as it must be, with a change in the correlative abuses which are advantageous only as seen from their stand-point, and are ready to mutiny against self-reformation, as well as economical advancement of an important industry, is no new phenomenon. The traveller who had camped out during a rainy season found that he could not go to sleep unless some kind hand emptied a watering-pot over him illustrates the force of a habit which demands a continuance of a practice however monstrous. This difficulty has already been discounted by the wise administration of the superintendent, aided in the management of the men by Mr. Silk, who to a clear understanding of the duties required of the labourer adds a wise appreciation of the men with whom he has to deal. To change habits, remove abuses, and set up new modes of action and a new code of morals as between the employer and the employed, and, in the end, retain the esteem of the men, demands a ripe judgment, as well as a true moral courage. What has been done warrants the prediction that a failure will not close the connection of Mr. Silk with the Boscaswell Mine.

It is needless to remark that the progress of the present day demands the employment of the best devised machinery, the closest application of the most intelligent system of manipulation, the highest consideration for the moral and physical well-being of the labourer. The Cornish system ignores every one of these principles, to the great loss of the capitalist, the injury and continued demoralisation of the labourer, and, of course, in arrest of all improvement. Should there be no improvement in these respects, in order to lessen waste in labour and material, before the wave of labour reform, demanding less time and higher wages, reaches Land's End, the tin mines of Cornwall will cease to be remunerative, and will have to be abandoned.

Fortunately, an intelligent management has taken possession of one of the most important mines, and this work of regeneration has already been successfully inaugurated. The continued success of this wise beginning will forearm Cornwall against the inevitable appreciation of labour before the waste of a false system has been corrected and a higher tone inspired among the labouring classes.

G. W. Baker, *Colorado.*

THE PRODUCTION OF COAL.

There is no more important matter connected with coal mining, than that of the individual produce, for it happens singularly enough that in some districts where the coal is thicker than in others the tonnage per man is less than in the thinner seams. It is also a fact worth chronicling that the districts in which the largest quantity of coal raised per life lost are those in which the men individually are the greatest producers, and the colleries the most extensive. Northumberland and Durham appear to be in an almost exceptional state as far as regards the production of coal and the safety of the workmen, perhaps in some measure due to the system of working, and to the manner in which the men are officered. The question, then, naturally arises, why should not some general system be adopted to ensure something like an equal quantity of coal being raised in districts where the beds are of almost similar thickness, or at least the most favoured in thickness, should yield as much as those not so well off? The subject is one which has led to a great deal of discussion amongst mining authorities, but without any practical results. At the present time it is evident that there are markets for a great deal more coal than is being produced, and the season, consequently, is a most fitting one for colliery owners taking steps for increasing the out-put of their pits. It has been stated that in some districts, such as Yorkshire, riddles are used, and the slack not sent out, whilst in the North large and small are both banked. That, however, does not apply at the present time, for during the last year or two there has been capital markets for small coal, and owners have taken advantage of it.

We must, therefore, look further for the actual cause of the small production in different districts. We agree with Mr. P. Cooper and others that whilst in Yorkshire and other districts the roofs are supported by pack-walls, which adds greatly to the labour of the workmen, in the county of Durham the roofs are almost entirely supported by timber props, which costs considerably less. The same authority also says that he considered that in the county of Durham one boy with a pony would on an average do five times as much work daily as a trammer would do in Yorkshire. The causes which led to Durham enjoying such a favourable position were—the mode of supporting the roof, the leading of the coal in the pit, and the workmen other than colliers being such a short time in the pit. Another great advantage belonging to the North is that the men are

under better discipline, and there are more overmen, deputies, and underviewers than in most other districts, whilst the hurriers are entirely engaged in bringing the coal from the face to the engine plane. All those are advantages which could be readily adopted at most collieries working, we should say, a seam 5 ft. thick and upwards, or even less; indeed, it seems to us that the great disparity in the quantity of coal raised per man in different districts is much greater than it ought to be. We are quite aware that in some localities the beds are very thin, and consequently the quantity raised must of necessity be small, for in the North-West Riding of Yorkshire some of the seams are little more than 1 ft. in thickness, so that less than a couple of tons is considered a good day's work for a collier. The rise in the colliers' wages, it must be said, has had a tendency to rather reduce the output of coal in several districts. This will be apparent from the following table we have prepared of the average quantity of coal raised per male person employed at the collieries in the different districts in England for the two past years, omitting all fractions:—

	Tons of coal raised per person employed. 1870.	1871.
Northumberland and Cumberland, and North Durham...	369	350
South Durham	410	417
North and East Lancashire	268	290
West Lancashire and North Wales	279	272
Yorkshire	316	332
Derby, Notts, Leicestershire, and Warwickshire	290	298
North Staffordshire, Cheshire, and Shropshire	309	307
South Staffordshire and Worcestershire	359	339
Monmouth, Gloucester, Somerset, and Devon	250	260
South Wales	318	240

South Durham, Northumberland, and North Durham, it will be seen, takes the lead in every way, not only as to there being less deaths according to the quantity of coal raised, but as to the output for every person employed. The marked decrease in the tonnage raised in South Wales is to a considerable extent due to a strike which lasted for some considerable time. Yorkshire shows a considerable advantage, although it was generally believed that the men did not work so well in 1871 as they did in 1870. However, the great difference in the quantity of coal raised in the various districts is well worthy of the consideration of all interested in mining operations; and, no doubt, attention having been thus accidentally drawn to it, it will lead to discussion and the lessening of the existing gaps.

COAL AT THE ANTIPODES.

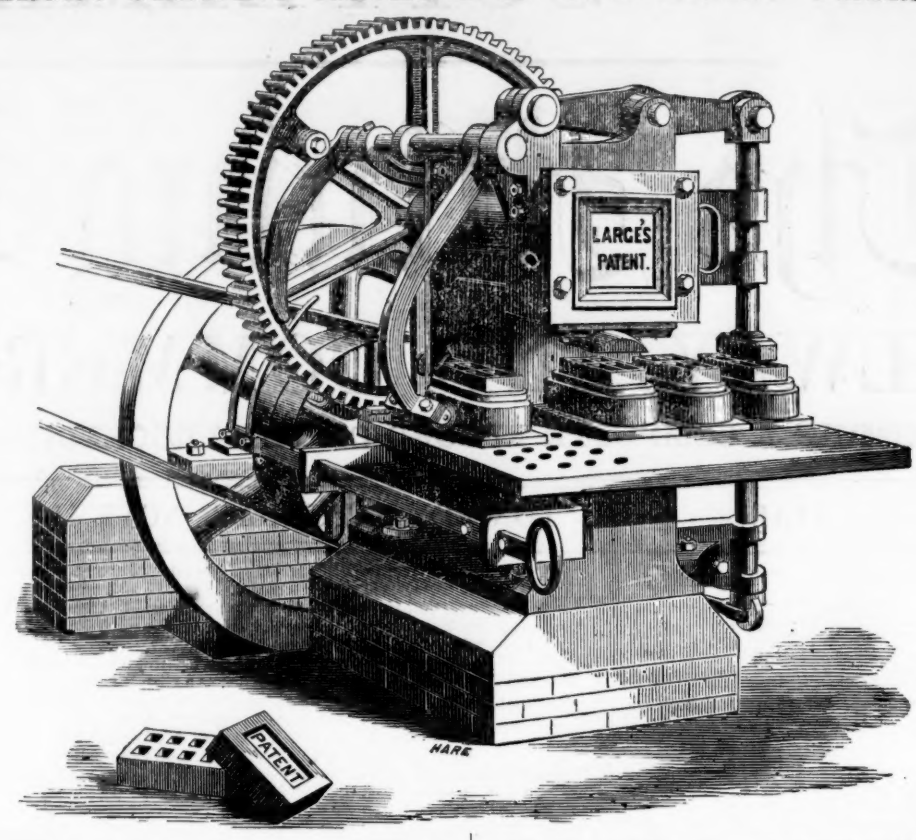
The coal question appears to be occupying an increased amount of attention in New South Wales, and the Government of that colony has engaged a gentleman lately connected with the Victorian Geological Survey to survey New South Wales, and to define the situation and extent of the local coal measures. The geological features of New South Wales will also be reported upon. One of the main objects for which the proposed survey is to be made is to ascertain the position of accessible coal measures in the districts to the westward of the Cordillera, with a view to their being utilised in the development of the other mineral resources of New South Wales. It is well known that coal measures of very great extent exist between the mountain range and the seaboard; but it is thought that coal fields nearer to the gold, copper, and tin bearing districts can be found more available for the development of the mines. Although there are large quantities of suitable timber to be had, mining operations are now being carried on to such an extent that it will not be long before the parts of New South Wales in the neighbourhood of its mines are denuded of their trees. The coal mines in the vicinity of Newcastle, Wollongong, Bulli, and other ports along the coast are being worked to a greater extent every year. Victoria has not yet discovered a coal field, whatever the future may have in store for her in this regard, and the exports of New South Wales coal to Melbourne are already very great, and are steadily increasing. Thousands upon thousands of tons of New South Wales coal are also now exported annually to India, China, California, and other countries, and the prosperity of New South Wales is, of course, materially enhanced in consequence. A fresh discovery of coal has been made in the neighbourhood of Ipswich, in Queensland. It is stated that the seam is 12 ft. thick, that the coal is of a quality not to be surpassed, and that the locality is in close proximity to the railway line. From Western Australia we learn that an effort is to be made to improve the navigation of Challenger Passage, and that negociations are to be entered into with the Peninsular and Oriental Steam Navigation Company with a view to the selection by the company of a position at Garden Island, Cockburn Sound, or elsewhere in the vicinity of Freemantle as a port of call and coaling depôt.

The importance of the utilization of Australian coal can scarcely be over-estimated. New South Wales and the other Australian colonies have attained of late years very great importance as centres of pastoral industry; but if they are ever to be thoroughly populous thriving communities they must become also seats of manufacturing enterprise, and this latter result can never be attained unless cheap coal is provided on the spot. Cheap Australian coal will also greatly facilitate the establishment of additional lines of ocean steamers for the conveyance of large numbers of passengers and emigants from the crowded haunts of Europe to the new openings for energy and enterprise which the Australias present. It is not a little remarkable that the discovery of additional coal bearings in Australia comes just at the nick of time. The Australias have long been known to be rich in gold, but this year—or within the last twelve months, at any rate—large quantities of workable tin have also been brought to light in New South Wales and Queensland, and this tin requires to be worked and treated in a scientific manner,—an object which cheap Australian coal will materially assist. Gold production in Australia is also now carried on upon a scientific system,—at any rate, the aid of science is invoked to a far greater extent than hitherto. It is true that alluvial gold mining is not yet at an end in Australia, but quartz crushing with the help of steam-power is becoming more and more the order of the day, and here again cheap coal will prove serviceable. The Australian colonies are not destitute of ironstone, and when once Australian coal can be brought into use this ore will be worked up into iron at a good profit, as time no doubt will prove. With the help of Australian rails made available for use at a reasonable price, the work of Australian railway construction will also receive an impetus of which it is difficult to now form an adequate conception. View the matter, in short, in whatever light we may, we are justified in saying that the discovery and utilization of larger and larger quantities of Australian coal is inaugurating a new era for the Antipodes.

The progress of the Australian colonies, as we have before stated, has been very slow. It is 100 years and more since Captain Cook first sighted the shores of New South Wales, and even now that vast dependency has little more than a population of 500,000. Human short-sightedness and human indolence have allowed the vast mineral wealth of New South Wales to remain undeveloped. But a new era is now dawning. Now that steam ships can cleave the seas, now that steam-power is achieving magic results on land, now that 20 words can be flashed from London to Sydney or Melbourne in almost as many minutes, now that education has rendered the English race more and more familiar with the remotest corners of the earth, it is impossible to doubt that colonization will advance with giant strides. It is not only labour which will benefit from colonization, but in colonization that capital will reap also a rich reward.

Improvements in Rock Boring.—The invention of Messrs. Francois and Dubois, of Liége, Belgium, relates to machinery where a piston receiving a reciprocating motion by compressed air or steam inside a cylinder carries a chisel for driving holes by concussion: the improvement consists, firstly in a peculiar arrangement for actuating the slide valve of the cylinder. The slide valve is connected at its opposite ends to two pistons working in cylindrical holes in the slide valve box; the steam or air under pressure has access to both sides of the one piston, while the other piston (of smaller diameter than the first) is acted on the one side only by the steam or air under pressure, the other side being opened to the atmosphere. An escape valve actuated by a trigger and a tappet on the piston-rod of the machine, allows the steam or air to escape from the one side of the first slide valve piston at the end of the back stroke of the machine, whereby the one motion of the slide value is effected for producing the forward stroke of the chisel. On the closing of the said valve an equilibrium of pressure is re-established on the said slide valve piston, so as to produce the return stroke of the slide valve. The driving chisel is rotated at each stroke by a pawl and ratchet wheel, actuated by a bar receiving a rocking motion from two small pistons in cylinders, into which the steam or air under pressure is admitted alternately.

LARGE'S PRESSING MACHINE IN OUR MINING DISTRICTS.



LARGE'S PRESSING MACHINE IN OUR MINING DISTRICTS.

Although only introduced at the National Exhibition of last year (1871), the Improved Moulding and Pressing Machine of Mr. Henry Large, of 60, Judd-street, London, has won for itself "a world-wide reputation." Three things doubtless account for this—1. Its simple and efficient mechanism, the small amount of motive-power required to work it, and the minimum tear and wear upon its working parts.—2. The success which has attended the experiments made with the machine, both at the International and since, under the direct management of the inventor, not one failure being recorded.—3. The highly satisfactory testimonials of those who are using the machine in pressing common and fire bricks, concrete bricks, and artificial stone, &c., and the preference given to all these by builders in comparison with the productions of rival machines.

It is not, however, the intention of the writer to go into the wide field of usefulness in which this machine is now being successfully used, but to enquire experimentally how far, or to what extent, the waste refuse of our Mining Districts can be profitably utilised. And we may preface that not only is the refuse of stone and slate quarries included, but also mineral resources which cannot be profitably turned to account under the old practice, but which may be so by the use of this machine, so modified in its construction as to meet the requirements of each case.

Three things will be admitted—1. That the slag and other refuse of our iron mines, the chips of our slate, marble, granite, and other stone quarries cost more money to get them out of the way than is generally credited.—2. That this refuse covers large areas of land, which if converted into garden ground for the miners and quarrymen would bring in no end of ready money weekly.—3. That, to speak in plain English, if this refuse can be utilised it benefits the country in more respects than one.

The reader will perceive that the practical question at issue in each case is one of actual experiment, to be made in order to determine whether such refuse can be turned to profitable account or not; and that as all the experiments made have proved successful, it resolves itself into this—How much will an experiment cost? And that as Mr. Large is a practical man, and has already performed numerous experiments, he ought to be, and we believe that he is, in a position to return a ready answer to such a question, so as to exclude fruitless speculation, and everything of the kind. No doubt there is another plan by which practical information can be obtained—the inspection of machines in use. This, however, is rather a secondary question for enquiry than a primary, for refuse material differs more widely than is generally imagined, so that mere inspection is not enough. If there is a machine in use in the neighbourhood an experiment may be tried, but as all refuse requires the addition of other materials, upon whose chemical nature success very much depends, and as clay and other mineral refuse differs very much chemically, such experiments require to be very intelligently conducted before they can be relied upon, for otherwise a very profitable enterprise may break down, owing to some slight oversight. If there is no machine at work within easy reach the experimental mode of enquiry, according to our proposition, is to communicate with the patentee, who most probably will reply, as he has done in several instances which have come under the writer's notice. "Forward sufficient material by railway to make a few bricks, and for so much I will return the bricks, and then you can judge for yourself what they are worth."

The interest of the owners and tenants of mines, coal pits, quarries, &c., may extend further than the mere utilisation of their furnace-slag, &c. Where large accumulations are on hand, as in the Black Country, there may be a sufficient supply to keep a machine going properly by mixing so much of the old along with the new. But where mines and quarries are newly opened it may be otherwise, so that parties have to calculate how to start a profitable trade. If, for example, a landowner has gravel, sand, burnt clay, rock unfit for building, or quarry chips, that can be broken down by machinery (as by Blake's stone-breaker), a concrete can be made of any of these for the profitable manufacture of concrete bricks in most places. Even where building stone can be had cheap the expenses of dressing is now such that it may be broken down and made into concrete brick of a more durable quality, and a house or fence built for less money, counting all costs. If there is brick and tile clay a machine may be kept partly or wholly going in making bricks direct from the pit. Three actual examples may be quoted for practical illustration—1. A landowner in Wales forwarded a sample of sand, and the bricks returned so pleased him that he at once set about converting his sand into artificial stone.—2. A machine is successfully at work in Kent making first-class fire-brick, &c., from calcined flint.—3. The managing director of the Staffordshire Brick and Tile Works Company says that bricks made by Large's machine are preferred by contractors, &c., and "as it becomes known must get into extensive use."

Large's machine may also be applied to two other purposes, which may prove interesting—1. The small coal at the mouths of coal pits may be compressed into blocks for fuel, or it may be mixed with ground peat, and the two compressed into blocks.—2. Peat in a semi-dry state may be compressed into solid blocks, so as to be profitably conveyed by sea or land to where they are required for fuel. Peat thus compressed, either with or without small coal, makes first-rate firing. It can be compressed into greater solidity by Mr. Large's than by any other machine now in use, and as its value depends upon its solidity, our proposition of experimental enquiry comes home, not only to the owners of millions of acres of peat bog, but to all who consume fuel.

By means of the annexed engraving, we shall now give a general description of this new machine. Small machines are made and worked by hand-power. The engraving represents a large one, driven by steam or other motive-power, by means of a strap over a pulley on the shaft of the fly-wheel. There are, as usual, two strap pullies, the one for ingear and the other for outgear, and the shift is made by a key-handled bar, whose mechanism and *modus operandi* are so clearly shown as to require no detailed description. The large spur-wheel is driven by a small one on the shaft of the fly-wheel. The large spur-wheel carries on the further side a reciprocating cam, which gears on a stud or pin on a horizontal bar, which, by means of bent-lever mechanism, actuates the piston for compressing the bricks. The head, or shoe, of this piston is seen raised over the second mould from the left hand side, directly under the imprint, "Large's Patent." On the front of the large spur-wheel is seen a friction cam-roller on a stud-axle. This friction cam actuates a bent-axial lever, and on the opposite side of the axis of this axial lever is another bent-axial lever, furnished with a long friction roller at its lower extremity. This latter is for pushing forward the mould with its contents under the compressing piston, and the mould under the piston, a stage forward. On the right hand side of the machine is a second piston, whose mechanism and *modus operandi* will readily be understood. This second piston is for emptying the mould by pressing the brick downwards through a hole in the table on to a platen table below, from whence it is removed. This platen table forms the head of a third piston, seen below, whose mechanism resembles that of a weighing machine. Thus the weight of the brick presses it down, and when the brick is removed by the attendant, the weighted lever at the opposite end raises the platen table to receive another brick. As the bent-axial lever on the left pushes the mould, with the newly pressed brick, it, at the same movement, pushes the third mould under the second piston, and the empty mould into the hand of the attendant, to be re-filled, and placed on the table immediately before the friction roller of the bent-axial lever. In this way the machine keeps the attendants close to their task, turning out from 5000 to 7000 concrete bricks daily ready for the builder, and common or fire-bricks almost ready for the kiln, as the clay, &c., can be worked drier than with any other machine.

From this general outline the reader will perceive that Large's machine has a twofold automatic movement—the one exclusively for compressing the bricks, and the other for shifting and emptying the moulds. In this the inventor shows his ingenuity to the best advantage, both in the distribution and economy of his motive-power and in the simple and effective mechanism by which such important results are effected. Thus each of the two inclines of the reciprocating cam on the back of the large spur-wheel forms a half circumference, consequently the first or compressing piston rises and falls at each revolution, rising during one half and falling during the other. During the downward movement the whole power of the machine is applied in compressing the bricks; but in rising, when comparatively no power is needed, the bent-axial levers, and the second and third pistons, perform their respective automatic functions. It will likewise be observed that as the principle of the reciprocating cams is that of two inclined planes, their length may be increased by increasing the diameter of the large spur-wheel, so that by increasing in a corresponding way the momentum of the fly-wheel any desired degree of power or pressure may be obtained for compressing bricks or other material. The power required to work a hand machine by a boy without extra fatigue is as easily calculated.

NEW ORE-CRUSHING MACHINERY.

Sir,—I notice a letter in the Supplement to last week's Journal on New Ore-Crushing Machinery, which is the same old story over again—high lift, with the same amount of power, or saving of power with less wear and tear. In all those notices I find facts and data scrupulously avoided—the *exact decrease* of power, the horse-power per head, the weight of a set of four heads, or as many as may be recommended to a coffer, complete with all fixings, amount of ore crushed (say) through a grate 80 holes to the inch, and what part of England may the machine be seen in actual operation on the mines. There are plenty of models and machines in London, but anyone about to erect a machine would do well to visit the mines where those new stamps are said to work well, producing such large results. The expense would be saved to any company in the judicious selection of an economic machine. I do not understand how the head can be lifted higher, and, by means of mechanism, reduce the power. It is evident the lever is lengthened, which does not seem to be compensated for in other arrangements; the same weight of head lifted higher must require more power. The head cannot be taken up direct unless the disc, or boss, on the stamp-stem receive a blow by the cam more or less heavy in proportion as you drive fast or slow. If the cam be so constructed as to take the disc easy you have the friction then both sides of the guides; therefore, the speed of the machine must of necessity be little in excess of the present stamps.

Your correspondent further asserts that this patent supersedes all steam, air, spring, and also Ennor's stamps; but an assertion without facts is useless, even from a C.E. This assertion is not borne out when we find such splendid results as are continuously coming before the readers of the *Mining Journal* obtained from the new stamping machinery already erected in Cornwall. Now, I contend

that the new machines, with extended grate-way and other improvements, giving the quickest and smartest blow, will turn out the greatest quantity of work, and such results cannot be obtained from gravitating heads. As to never understanding Mr. Walker's specifications and drawings, I think them not so complicated but the merest tryo in mechanical drawing might overcome, and alse find the City-road Works, without the aid of Mr. Cooke's elaborate description. I should like to ask this gentleman for his reasons why the steam-stamps is not equally applicable to hammering rock as well as iron and why it is not discarded in America? Also, does the patent he recommends supersede the Californian revolving stamps, numbers of which are being made in this country, and almost exclusively used in California and Australia?—*London, Nov.* 18. STUDENT.

THE PELSALL HALL COLLIERY EXPLOSION.

SIR,—Permit me the use of your columns to appeal to a generous public on behalf of the 15 widows and 45 orphans who have lost their mainstay by the terrible calamity at the Pelsall Hall Colliery, in this village; the presence of the fatal choke-damp, and the fall of the roof, dashes to the ground every ray of hope of saving the entombed men alive. A public meeting has been held this morning, a committee formed, and upwards of 500*l.* subscribed, but unless we are largely assisted by others, the distress will be overwhelming, three-fourths of the inhabitants being workpeople or small tradesmen. The committee do not think their appeal will be in vain.

Lloyd's Banking Company (Limited) and all their branches (Messrs. Barnetts, London agents), and the Staffordshire Joint-Stock Bank (Limited) and all their branches (Messrs. Barclays and the Imperial Bank) have kindly consented to receive subscriptions; or, they may be sent direct to Richd. Jesson, Esq., Walsall; Boaz Bloomer, Esq., Pelsall, treasurers; or, to— EDWARD J. SHOEMACK, *Hon. Sec.*

Pelsall Iron and Coal Works, near Walsall, Nov. 19.

ORIGIN OF COAL.

SIR,—Enclosed I forward you a translation of a clipping from the Drontheim newspaper—the *Addressecontors Efterretninger*—of the 3rd inst., and will feel obliged if you will insert it in the Journal for the consideration of your readers. J.

"At the present time, when questions are everywhere being asked about new coal mines, allow me to set forward a thought, the value of which there will no doubt be skilful men to judge. I am led into this by reading an article in "Northern Tidings for Politics, Economy, and Literature," of June, 1867, about modern geology. This article gives a review of two German works—"History of Earth," by Friedrich Mohr; and "Geology of the Present Time," by Bernhard von Cotta. Friedrich Mohr is of opinion that the strata of coal have been formed by enormous masses of sea weed, which have been gathered up by the currents of the sea in many places, and he states several reasons for this opinion. If this should be the case, it would not be absurd to suppose that similar accumulations had taken place where the Orlandet (a large alluvial deposit) is now situated—a place where, according to the nature of things, as the soil is formed by alluvium, it must be supposed that, while the water covered the ground, there has been a 'Bageoje' (reaction) between the currents from the inner and outer parts of the firth, and by this contra-current considerable masses of seaweed may have been gathered up, and by their sinking formed strata in connection with the alluvial land."

COLLIERY ENTERPRISE IN WESTPHALIA.

SIR,—Why is it that English capitalists do not take advantage, on a larger scale, of the magnificent state of the several industries of this (Westphalian) district? This is a question which is constantly occurring to me, and the only answer I can bring forward is, for want of its being brought under their notice. Ironworks are paying 25 to 35 per cent. on their original capital, and collieries 40 to 60 per cent. New coal fields are being explored. Why should not English capitalists commence collieries, and derive benefit from the prosperous state of the several industries? An extent of about 2000 acres could probably be obtained for about 30,000*l.*, and with a further sum of 100,000*l.* to 130,000*l.* two separate and distinct establishments might be completed, capable of delivering together 1500 tons per diem, which, from the many seams found in this district may easily be attained; this would be 420,000 tons for 280 working days per annum, which at a profit of 4*s.* per ton (at the worst of times readily attainable) would leave a yearly profit of 84,000*l.* These data are are not taken from the present flourishing state of the coal trade, as the present profits reach as much as 10*s.* to 12*s.*, and in some instances 16*s.*, per ton.

It is only requisite to refer to the market value of the Westphalian collieries on the Berlin, Cologne, and Essen "Bourse," commencing with "Selters-Nenach," which is quoted at 35,000 thalers per 128th part of the mine, or a total value for the mine of 672,000*l.*; "Consolidation" at 576,000*l.*, both being situated near Essen. Then refer to the progressive mines, some of which are not yet in the coal measures, and others only just reached them—viz., "Unser Fritz," about 60 fms. sunk, and still have about 60 fms. to sink before reaching the coal measures quoted, but not to be purchased at, 75*l.* per 1000th part; "Konig Ludwig" and "Ewalt," about the same depth, respectively quoted at 66*l.* and 75*l.* per 1000th part, but not to be had for these figures. I cannot at present say exactly how much has already been called-up on these shares, but do not think more than from 30*l.* to 35*l.* has been paid, including purchase of fields, &c., &c. I might quote several others, but do not consider it necessary.

Explorations for coal are also being carried on with much energy in the north part of the basin. Early in October one company applied to the authorities for a concession, having bored coal at 1600 feet (the deepest coal explored in Westphalia). This hole was put down by hand, in 5 months and 26 days, an achievement to be proud of.—*Dusseldorf, Nov.* 13. JEPPE.

ON "PRACTICAL MINING."

No. II. OF MR. N. ENNOR'S "VIEWS."

[*Vide* Supplement to the *Mining Journal*, September 28, 1872.]

SIR,—Following Mr. N. Ennor's example, we will not raise the question as to the age of the world, that being for us, the operative miners, at least unprofitable; but what appears a practical question is the whereabouts of these old tin works, near and about which Mr. Ennor asserts millions of tons of copper have recently been found. The fact of the find need not be questioned, but it would be interesting to know more of the old tin works. We might also receive the assertion for what it is worth, that a "watchful practical" knows well a young and thriving lode from an old hard dried one, that the ore is decomposing from and leaving; but it would be satisfactory to us who have to deal with the refractory copper-bearing works daily, in a summary manner, to know the basis of this theory, and to Mr. Ennor, far more reasonable conclusions, that the bulk of copper in Cornish mines has grown (!) within the past 200 years. Let us hope this "view" has a better foundation than even the unanimous decision at the old men's meetings referred to when assembled of an evening to relate fairy tales and ghost stories, or even of—

"A woman's story at a winter's fire,
Authorised by her grandam."

If it is a reasonable conclusion that millions of tons of copper have grown near and about old tin works within the past 200 years, is it unreasonable to enquire where the next harvest of copper is likely to grow, or when to be expected—within the next 200 or 2,000,000 years, or about the time of the Greek Kalends? Again, half the mines of a district are to be abandoned at once, but the suggestion to find new ones, and work only the right sort of old mines, might be considered sound practical advice, if only accompanied by one or two slight omissions, to assist us in solving the problem which has puzzled miners for ages—*i.e.*, where to find the new ones, and how to distinguish the right sort of old mines.

In a treatise on Practical Mining surely it is not too much to expect a hint or instruction whereby to find the junctions spoken of, where many substances and electricity are brought to bear at a certain point, and the lodes that are running in the right direction. These things we, the novices, "long to know," as having now to use our best judgment, hard blows, and cash in search of these conditions, we appeal to the practicals—

"And conjure you by that which you profess,
(Howe'er you came to know it) answer us."

To relieve our anxieties on these points, and instead of indulging us with crude "views" as to when and how lodes or veins grew, deign to tell us where to find the mineral deposits, and assuredly you will reap a rich reward. But what hope exists of obtaining the desired information? Very faint, it is feared, when a pre-eminently practical man closes a chapter on Practical Mining, No. II., his "views," in anything but a reassuring strain, as to the capabilities of professed "Practicals" exclaiming in bitterness of spirit, as to mines—"No one knows what to work, and what to abandon."

But, with all due respect for your many practical correpondents, this opinion cannot be endorsed by many constant readers of the *Mining Journal*, and amongst them— A. R. R. O.

Oct. 30.

SOUTH AURORA MINE, AND THE DIAMOND DRILL.

SIR,—As one interested in the general success of mining, I desire to express my views in the *Mining Journal* on the subject of *Boring* for Metallic Minerals—or, perhaps, I should rather have said, "reiterate my views," for I have previously expressed them in your columns. When it was first proposed at the Eberhardt meeting to introduce the *Drill* for the purpose of exploring for metallic minerals I was in Nevada, and being fully aware of the inutility of such a method, I immediately on receipt of the Journal containing your report of that meeting wrote you, Sir, in terms strongly deprecatory of such a method of mines exploration, and which communication you very kindly published. I endeavoured to show, and think I succeeded, that such a method would be most ineffective and unsatisfactory, and that in respect of no class of deposits could a more haphazard method be adopted than those contained in the White Pine limestones. I stated in the letter referred to that not five merely but if 50 holes were drilled into a section of ground of the area of the Eberhardt Mine, it would be no sufficient evidence that the intermediate ground was not valuable.

It was stated at the South Aurora meeting, held on the 6th inst., that $10,937 had been expended in drilling five holes, amounting in the aggregate to 1944 feet, or an average of 388 feet 9 inches per hole, and that not perpendicular, but at an angle of 45° from the horizon. This so-called exploration has been made, and nothing has been found, and some disappointment has been felt and expressed at the result. The ground submitted to this experimental operation is understood to be *explored*—indeed, it is said to be. The Chairman's words, referring to the subject at the meeting, were—"The drill was deficient in power below 500 feet, and to that depth, at all events, a considerable portion of the mine had been explored. There was a further portion not yet explored, which Mr. Goodfellow seemed now to be proposing to do. He confessed he should like to see the drill set to work at the Lower Flat, because it had not yet been explored lower than 90 feet." From the nature of the deposits in the White Pine limestones occurring in cavities or chambers in the rocks, and not in regular veins or ore channels, I am free to confess that the very ground on which the explorations referred to have been made is not diminished a particle in its prospective value, in my estimation, by those operations, but that it is as valuable now in this respect as ever before. There is nothing to guide the miner in the prosecution of this work, and the holes may as well be bored, or are as likely to be, in poor sections of ground surrounded by ore, and much more so than in the deposits of ores themselves, and for the very simple yet forcible reason that the percentage of poor ground is largely in excess of the good. The deposits of ores in this formation seem to be independent of each other, as no connection or links between the several deposits can be "but in exceptional instances identified," and, therefore, the ground intermediate to the perforations already made may be found to contain vast and valuable bodies of ores. I am fully persuaded in my own mind, after a careful consideration of the subject, that boring for metallic minerals, when resulting, as in this case, in finding nothing good, that that does not prove, and never can unless in very exceptional cases, that the ground submitted to such an ordeal is what it may appear to be as the result of a trial by such a process, whilst, on the contrary, it may be the reverse in nine cases out of ten, and thus the outlay made be found to be a waste of money expended for no better purpose than to procure an additional liability to err, which might result in the loss of valuable mines.—*Liskeard, Nov.* 15. ROBT. KNAPP.

THE FLAGSTAFF MINE.

SIR,—"A Sanguine Shareholder" asks how the rest of the monthly profits is applied after payment of the dividend. The question is a natural one, seeing that as yet only 40 per cent. of net profits have gone into the shareholders' pockets. But it must be remembered that the company have had large and unusual expenses in this the first year of their existence; moreover, the cost of storing such enormous supplies of charcoal to secure continuous running through the winter, and of erecting additional furnaces, must have materially diminished the rest of the profits. In the face of this I am surprised that dividends have been declared with such praiseworthy regularity as they have.

It is with some a matter of surprise that the Flagstaff shares do not command a higher price, and no doubt if the increase in the current dividend had been made on a more liberal scale a substantial rise in their value would have followed, but this would not have proved the property to be in a sounder position than I believe it is in, and a rise in the market value would be a matter of perfect indifference to those who, like myself, are permanent holders. I am satisfied that the directors deserve the fullest confidence of the shareholders: if they have erred at all it is on the right side—that of caution: they are guided solely by a desire and determination to do what is now, and what will prove hereafter to be, the best for the interests of the company, by making the Flagstaff permanently remunerative, instead of allowing it to become a shuttlecock for Stock Exchange purposes.

A word as to the report of Mr. Frames. No one can study it without being struck by the ingenuous and truthful tone of the writer; nothing is said therein which can unduly raise expectations, but the "notes" are those of a man who has gone out to judge for himself, and who records the results of a careful observation with moderation and candour. PARTICEPS.

PHŒNIX QUICKSILVER MINING COMPANY.

We have been requested to publish the following letter, which has been addressed by MR. FRANCIS FOWLER to the Editor of the *Times*, in reply to some remarks which had appeared in that journal:—

SIR,—On my arrival in London from Salt Lake City, on Thursday last, I was astounded to find that my name had been made such free and unfair use of during the past three weeks in your articles in connection with your criticism on the Phœnix Quicksilver Company.

In your comments on Thursday last on Mr. Macdonald's letter, you state that you have made no attack on Mr. Fowler's private or professional character, and then go on to say that it is the directors of the Phœnix who are to blame for not defending Mr. Fowler, if they could have done so. What were they to defend me from, if not from the insinuations against my private and professional character implied in the insidious series of questions you allowed your correspondent "Verax" to give a world-wide currency to through your journal? You repeat these questions yourself on Thursday, and the bearing of your whole argument is that, till answered satisfactorily, the lurking charge behind them renders my report on the Phœnix Mine unworthy of credit.

As regards my private character, I can appeal to all who have ever known me. I am personally well known to the Messrs. Rothschild, whose name has been introduced more than once in this correspondence, and I think I can safely say they would be the last to throw any discredit upon it. As to my professional position, I need say no more than as a member of the Institution of Civil Engineers I have passed the ordeal of the council of that body and gained my standing through the support of the highest members of the profession, including among others the late Mr. William Gravatt and Messrs. Hawkshaw, G. P. Bidder, J. Fowler, Edwin Clark, and other eminent members of the Institution.

Well, Sir, I am the Francis Fowler who in 1866 was engaged as engineer to a certain financial company, which burst up in very good company with world-renowned banks, &c., I had nothing to do with the promotion. I am the Francis Fowler who reported on the Saturn Mine, who reported on the Mammoth Copperopolis Mine, who was appointed manager of both companies, and held that appointment when I was engaged to survey and report on the Phœnix.

It is bad enough to have failure in one's career thrown in your teeth, but it is unbearable to have one's successes malignantly distorted into a weapon of attack. You charge the directors of the Phœnix with engaging me while knowing less about my qualifications than would have satisfied them in the case of the commonest clerk, which is utterly untrue; and you allow "Verax" to assume two companies with which I was connected to be failures when the slightest enquiry would have proved his egregious mistake. It is true that neither of these companies has as yet "paid a dividend," but what of that?

The Saturn Company was formed in the latter end of 1871, but the furnaces were only started in June last. The Mammoth Copperopolis was constituted in December last, but work was only commenced in the ensuing April, and it began making profits within a month from starting. Am I responsible for the great snowstorms of last spring, which stopped so many mines, filled up the Emma, cut up all the roads, delayed the completion of the railway on which so much depended, and which is yet 50 miles away from the Mammoth? Is it chargeable to me as a fault that the calls were delayed in payment, or that I should be held liable to do as much in opening the mine with half the money wanted as if the whole had been sent at once? The directors of the two companies agreed to share jointly in my time; the mines were 70 miles apart, each required my undivided services, and I had the smelting-works also to attend to. I was perhaps to blame for undertaking such a task, and it appears, therefore, failed to give full satisfaction to either company, and neither, as I conceive, made due allowance for the unexampled difficulties I met with at starting. A quarrel arose between us as to the delay in forwarding certain returns, temper was lost on both sides, it became a matter of discipline, and of our respective rights. No fault was ever found by either company with either my moral or professional character. The result was we parted. This is for a committee of enquiry, which I insist upon with both companies, but your columns are hardly fitted for the discussion of the differences between us.

I find that the secretaries of both companies wrote letters to you in regard to my difficulties with them, adding in the case of the Saturn that a true fissure vein was proved to exist, and that a profit of 300*l.* per week was then being realised; at the time I left I was clearing 100*l.* per day, so I cannot see any "improvement in the management." In the case of the Mammoth, the directors had no reason to doubt the correctness of my original report about the mine, and giving details in proof of its extraordinary progress up to the time I left. I am not answerable for the future. The directors of both companies are honourably bound to uphold my reputation as a mining engineer, and you should not charge the Phœnix board, who knew of the realisation of my predictions about the value of the Mammoth Mine, with engaging me without knowing whether I was a fool or a knave.

The *Times*, Sir, goes everywhere; the insinuations against my private and professional character by an anonymous correspondent which you have admitted into it, while I was supposed to be 6000 miles away, might have destroyed my prospects in life; you have thus done me a grevious wrong. I ask you to make me a proportionate reparation, and either substantiate your insinuations or withdraw them. In justice to the Phœnix Quicksilver Company I will add that it is without exception one of the finest properties I ever met with, and I stand by every word I have reported on it. Your suggestion about the owners waiting to be paid out of profits must have been made in ignorance of the customs of the class of men who chiefly own properties of this kind; they are mostly miners, who hold for sale, and require cash to enable them to prospect other mines—men, in fact, who are bent on seeking to make sudden fortunes by lucky finds, and to whom, therefore, your proposal would come as a mockery.—*London, Nov.* 18. FRAS. FOWLER, M.Inst. C.E.

THE ANGLO-BRAZILIAN GOLD MINING COMPANY.

SIR,—Your correspondent of last week, when commenting upon the proceedings of the secretary whilst in Brazil, might, I think, have quoted another instance of officiousness; but possibly he may not have been cognisant of the latter, as it was not brought forward at the meeting. I allude to the removal of the Rio agency from the eminent firm of Messrs. Bramley Moore and Co., in whose hands it has been since the formation of the company, and who are yet the agents of some Brazilian mining companies, and several important undertakings. How the secretary could have so unwarrantably assumed such a responsibility in the face of the fact, according to his own statement, that he did not go to Brazil in connection with this company, is as inconprehensible as the apathy manifested by the directors in allowing him to exercise what power he pleased out there.

If he remains in his present position, are we to hope that the infusion of new blood into the home direction will be productive of better results?

Nov. 19. A SHAREHOLDER.

WHITEHAVEN IRON MINES.

SIR,—I have not the *Mining Journal* here, but before I left home I saw in it another letter by "J. Hodge." I cannot perceive any reason for the prolongation of a correspondence relative to these mines. I have no interest as a shareholder in them, and I guess that Mr. Hodge has none. What his object is in writing I cannot see. I have no time to waste upon useless discussion. I will, therefore, respectfully submit the few statements subjoined:—

1.—There is no portion of the land granted to the company "on which the sun does not shine"—except, perhaps, Scale Force, a deep and narrow ravine in Floutern Tarn sett.

2.—There are several ferruginous lodes in Floutern Tarn that would pay well if there was a good way of transit for the ore.

3.—That after a sufficient and reasonable test of the lodes has been made a railway should be laid down from the mine to Cockermouth or elsewhere, for the transit of the ores, if the condition of the ores, after the test, should justify the expenditure.

4.—A railway from Eskdale Mine should be constructed at once, to form a junction with the Furness Railway, which railway would subserve also Mr. Thomas Harvey's mines, situated on the opposite hills, said to be capable of an enormous yield of iron ore of high produce.

5.—That the five lodes in Eskdale sett and the lodes in Mr. Harvey's, fully developed, would doubtless yield as much ore as one locomotive could draw to the nearest station on the Furness Railway.

6.—The mine is not likely to give any dividends, or very little, while worked in the present style.

7.—That if Capt. Hosking has left the company, as I have been informed he has, they may save the expense of a successor, while so worked, because Captain Rosewarne is competent to fulfil the whole agency at Eskdale Mine.

8.—The 30 cottages commenced in July at Eskdale should be completed as early as possible, that the miners may occupy them.

Mr. J. Hodge says that he never saw the Eskdale Mine. Then why did he presume to speak of it as he did? Who told him that there was a spot there or at Floutern Tarn "on which the sun never shone?" R. SYMONS.

Roche, Nov. 19.

MINING SPECULATIONS.

SIR,—Mining, like business, at present appears to be in a state of *statu quo*. About three or four years ago a discovery of some importance was made in a mine called the Van, in Wales, and shares rose to fabulous prices, as usual in a hundred previous instances, and doubtless will exist so long as the old adage—that fools and their money are soon parted. I have been connected with the discovering and management of mines in Cornwall, as well as Wales, for about 30 years. I have witnessed many such years of insanity as 1825, when all the world went mad. Formerly, in the good and prosperous days of mining in Cornwall, mine shares were valued at four years' purchase by men of the greatest experience and soundness of judgment; but latterly the fashion has been to value and sell a thing for what it will fetch. But what is in a name? Brass will sometimes sell at the value and price of gold. Now, recent events prove the fact that hundreds—nay, thousands—of persons have been ruined, which I find stated in every town I visit. Honest mining is a praiseworthy pursuit, and none more legitimate; but the majority of mines are floated without any merit, or of any commercial value. I can name a hundred mines stated at fabulous premiums, and rigged in the market at still more fabulous prices, their only merit being that mil lions of money sterling is stated to have been returned from them.

Well, Sir, when the egg is cleaned out the shell is left; neither does a bird return to the same nest the second year. Embarking in old mines is just like a youug man marrying his grandmother. To men of judgment such old mines may be compared to a whale swallowing water. Some gentlemen I hear say—Well, what can we do? there is a great rage for mine shares, and anything will sell while the public are in the humour. We do not possess eyes like those of Argus, neither has Providence given us the talent of discovery. Any name—Wheal This or Wheal That—will do for the Britishers, whether of Salt Lake or Llanidloes. Devon Consols lode was to be found a few years ago all over Devonshire, and even in Cornwall: the Van lode could be traced throughout the length and breadth of the Principality of Wales; the Burra Burra lode was to be found throughout all the provinces of Australia. Well, Sir, when will John Bull know better? The new system of Education does not appear to have done much good so far.

But for the *Times* exposing some of the El Doradoes, how many thousands more would be reduced to utter ruin and misery? The *Times* is the greatest physician of the age: it has done this much—saved hundreds, nay thousands, of families from destruction, and the heads of families from committing suicide. Some fearful evidence has recently come to the writer's knowledge, which is the principal inducement to pen this letter, trusting it may be the means of doing some little good. Mining is an honest and legitimate pursuit, and if the answer is, we cannot tell where to discover mines, such persons should be content to follow, and not lead. There are plenty of men well qualified who can discover mineral wealth without robbing and plundering the public; but, unfortunately, men who write lies that read like the truth are too frequently believed, and succeed in preference to men who really write the truth. The minds of the labourers have recently been as though inflated with gas, and a few coal owners and iron smelters caught the disease, much to their disadvantage in the end, and great disadvantage to manufacturers, shipping merchants, and the public generally. The labourers would not half work. Idleness is the parent of vice—immorality, drunkenness, and depravity succeed and follow each other.—*London, Nov.* 19. A. BENNETT.

NORTH AND SOUTH CROFTY MINES.

SIR,—A writer in the Journal, who subscribed himself "Captain" a few weeks ago, wrote in favour of the appointment of a surveyor to watch the operations of miners to prevent encroachment by one company on the rights of others. He supported his argument by reference to the South Frances lawsuit, to the encroachment by South Frances on West Frances and West Basset, and to that of East Pool and South Crofty. This reference at first appears forceable, but few words will, I think, be sufficient to show that a salaried surveyor is unnecessary to prevent any encroachment. Every lord has a mineral surveyor, whose duty it is to watch the progress of levels, to prevent encroachments. "Yes," says Captain, "but they omit their duty, hence the encroachments complained of." True, but does past neglect necessitate future neglect? The lords, or their stewards, seeing the mischief occasioned by past neglect will, I doubt not, direct their agents to attend to their duty in time to come. Again, in almost every mine one or more of the agents can dial as well as any professional dialler, and it is only for the adventurers to insist that constant attention shall be paid to the plans, so as to prevent the mischief of over-drift the evil will be prevented. There is no occasion to put the adventurers to the monthly cost of a guinea or two; and I object, as a shareholder, to the imposition by a lord's agent of a surveyor on a mining company, because he wished to befriend that surveyor.

Owing to the experience of the past, I am persuaded that every lord and every manager of mines will so vigilantly watch the operations underground that we shall hear no more of encroachments such as those referred to. The case of John Vincent's house, also, is not likely to be repeated. Those persons who objected to the line marked out by Mr. Marriott were very foolish, and their folly was expensive. The lease of Wheal Harte (West Basset) was full of errors. The name of Vincent was James, not John; the house was 100 yards out of its proper position in the plan, and the house, as shown, was a mere blot. In the lease the line eastward was drawn from the north-east corner of the house, and in the counterpart from the middle of it. The deed will be a standing disgrace to those who prepared it in Tehidy office.—*Cumborne, Nov.* 19. A SHAREHOLDER.

LEGITIMATE INVESTMENTS.

SIR,—How is it that shares in such a mine as the ALMADA AND TIRITO are being sold at or even below par? This company has never been one of the sensational ones, and yet is paying 10 per cent. per annum during what may be called its infancy, and before the rich deposits known to exist are reached. The manager has issued a concise and sensible report, and I trust, at the meeting to be held to-morrow, the shareholders will show their appreciation of the excellent management at home and abroad, which I, as an original shareholder, would do were I able to be present. I trust your report on Saturday will show that my co-shareholders have an increasing respect for the value of their shares.

FLAGSTAFF.—Here is another mine, paying now 30 per cent. dividends, selling

at 16*l.* on the 10*l.* share. With two furnaces running this mine nets 15,000*l.* weekly, while the above dividend only absorbs 7500*l.* Surely, we ought to be well pleased with this; and, more than this, that stores are laid in for the winter, and a reserve fund is being formed, which I believe is the case. As the third furnace is by now most likely running, the returns will be further increased, and we, the present holders, enriched by augmented dividends, or our heirs or successors in possession of an interest in certainly the most legitimate of Utah Mines. Our manager is most able, and this is a point of the most vital consequence. Buying Flagstaff shares at present prices would yield equal to about 18 per cent., with every prospect of a further advance of dividend, and an enhancement of value of shares by the formation of that desirable adjunct—a reserve fund.

A Sanguine Shareholder.

SQUATTERS.

Sir,—In the Supplement of last week's Journal your correspondent quotes most meanings to the word "Squatter" except the most applicable. In Australia a squatter is one who leases or purchases a large extent of territory, converting it into a sheep-run; uses it for breeding cattle or producing farm stuff; making it a homestead or otherwise. If my memory serves me it has the same meaning in California. Therefore, the term squatter is applicable to the "bargain-men," or leaseholders, on the Red River. On the Victorian diggings the term "jumper" means one who obtains possession of another's claim, "sett," mine, or ground pegged off by fraudulent measures or trickery.

I cannot think that "Argus" meant anything offensive to squatters on the Red River; those men are generally the best tin dressers, and most energetic, persevering, and plodding, although not usually in a position to avail themselves of the most modern and approved appliances for their work. Student.

Nov. 18.

AN HONEST MINE AGENT.

Sir,—There are many—alas! too many—persons who think that in case of bankruptcy or composition with creditors they are for ever discharged from all obligation to pay their debts in full; and who are disposed to laugh at a man who, taking an equitable view of his position, and not a legal one merely, will at the first opportunity pay his creditors the balance due. In a legal point of view a bankrupt is free on receiving his discharge in the Court, but not so in equity, which is better than law. No truly upright man will fail to pay all his debts when able to do so, notwithstanding his legal release. The case, however, is so rare of bankrupts paying their debts that people look with surprise on a man who does so. A Cornish mine agent who was bankrupt a few years ago is doing his duty by paying off his old debts, as debts of honour, as quickly as his receipts enable him. S.

Nov. 19.

LONG SERVICE.

Sir,—It is worthy of remark and of record that the late Mr. John Blamey, of Scorrier, and the late Mr. John Pearce, contemporary clerks in the office of the Messrs. Williams there, held their places nearly 60 years, till their decease. Mr. Blamey was cashier the greater portion of the time, and Mr. Pearce was land agent, &c. It has been said that a million sterling passed through Mr. Blamey's hands annually. The present cashier is Mr. Hugh Sims, son of the late Mr. W. Sims, of Whitehall, C.E., and was also contemporary with Blamey and Sims for 50 years. He has been in the office about 58 years. But the most remarkable instance of long service is in the case of Mr. T. Treloar, of Helston, who has been clerk to Messrs. Grylls and Co. ever since 1806—66 years! He attends to the land stewardships and tithe matters, also the Union business, and looks like one likely to see many returns of Christmas-day.

Long service proves two things—1. That the masters are good, and not fickle-minded, turning off faithful employees without reason, nor paying them inadequately.—2. That the employed are faithful to their employers, confidential, and rendering satisfactory service.—*Truro, Nov.* 19. R. S.

[For remainder of Original Correspondence see to-day's Journal.]

Royal School of Mines, Jermyn Street.

[FROM NOTES BY OUR OWN REPORTER.]

Lecture LIX.—We now come (said Mr. Smyth) to an old implement of great importance. If we speak of "stamps" in many parts of England, we shall find that few persons know what is meant, but so great has been the progress of mining in which stamps are required, and so much attention has been paid to their construction and arrangement, that they have arrived at a state of great completeness, not only in this but in other countries, and especially in our own. In the gold mines of California they began, with child-like simplicity, using a very small apparatus to carry out the trituration and separation of material on a large scale; but as years passed by, with the assistance of practised miners from all parts of Europe, they now deal with the work on a gigantic scale. In our Cornish and West Country tin works stamps are erected on a large scale, and in two districts in Europe—Schemnitz and Cremnitz, in Lower Hungary, where thousands of stamps are at work on the gold and tin ores of that region—and in Transylvania. Stamps were described in much the same general form in the days of Agricola as that in which we see them at present, the principle being precisely the same. A long bar or pestle of wood (in those days, but now of iron), attached to a shank, strapped on in various ways to prevent the wood from splitting, and then, having a weight of cast-iron at the bottom, it is lifted a few inches by a rotating axle above, generally turned by a water-wheel, with a number of projections on its surface, which come into contact with corresponding projections on the beam by which it is lifted. The beam then falls with great violence on the material placed beneath in a kind of mortar or box, called a "kofer." At the stamp-mills of California the quantity of bullion they turn out is so considerable that any particular item connected with the stamps is of so much importance that one class of men have specially devoted themselves to this work, and are called "millmen." At the side is some arrangement for feeding the kofer—as, for instance, an inclined trough, leading down to it at the back; and then in front an outlet of discharge is placed. The vertical beams or pestles, shod with iron, are called the stamp-heads; the tongues, attached by which they are raised, are designated "lifters;" the revolving axle is called the stamp-barrel, and the projections upon it which lift the apparatus, are the "cams." The frame and the entire set of stamps is called a "battery," and may consist of three, four, or five stamps in a set. Although interesting in mechanical details, it is by no means a perfect instrument, and there is a great deal to study with regard to the comparative merits or demerits of different arrangements.

I may mention at once that within the last two or three years some valuable works have come out, which give a great deal of information with respect to the stamps now used in the gold disiricts of Australia and America. Amongst these are the admirable books of Smith and J. A. Phillips, and the reports of Rossiter Raymond and J. B. Hague; the last-mentioned contains some fine drawings. There are also some excellent models in this Museum of the best kinds of construction used in the tin districts of Cornwall. The terms wet and dry stamps only designate those which pound the material dry, and those in which water is admitted into the kofer. The "heads" are a mass of cast-iron, weighing, perhaps, in former times, 1 cwt. each, and with the wooden lifter 1½ cwt. About 30 years ago, however, it was found necessary, in dealing with quartzose gold ore in which the precious metal is disseminated through it, greatly to increase the weight, and the Cornish miners have followed the example. So that it may be said that the average weight of the lifter and head together is from 6 to 8 cwts., and in California even more. With this weight, and the fall from 9 to 12 or 14 in., they get a tremendous blow on what lies beneath it. It will, however, be seen that if a large lump gets in, the fall is so much lessened that of late the larger lumps have been first "spalled" or broken with a stone-breaker. Then, as to the material of the heads, hard white cast-iron is employed like that for the surface of the crushing rolls. Ironfounders have given great attention to the subject, and some claim to be better than others; but in any case so large is the wear and tear of cast-iron, which, of course, goes away with the material, that its removal afterwards forms an item of cost to be met as well as the expense of replacing the stamp heads themselves. In California they have introduced a "shoe," a device which our miners might turn to advantage. The head is divided into two parts, the lower of which, or shoe, can be removed when worn down, and another put on without much loss of time. In California, also, the lifter is generally made of wrought-iron, and if wood is used it is generally a very hard kind, with a straight grain, about 6 in. square, and from 10 to 12 ft. in length. When iron is used it will be from 3 to 3½ in. in diameter if circular. The wooden stems, with square heads, have, however, been almost universally superseded by the rotary stamp, with a round stem of iron, to which a circular motion is given by the friction of the cam in lifting, and which, being continued up to the moment of its release, is prolonged during its descent, thus imparting a grinding action to the cylindrical head at the moment of its coming in contact with the rock to be broken. The rotary stamp is said to be more efficient than the rectangular one, and to grind a larger quantity of rock in a given time; but, however this may be, it is certain that the faces of the heads wear more evenly, and that a rotating battery requires less frequent repairs than one made on the old principle.

So much for the heads and lifters, and now as to keeping them properly perpendicular. At first this is easily done, for the tongue or tappet, projecting at right angles from the lifter, makes it work as near the centre of gravity as possible. But as the head wears away the tongue must be shifted lower, and, in short, be varied in order to meet the altered circumstances produced by the wear and tear of the lower parts. A great many different contrivances have been proposed as to the "cams" for the purpose of giving them the power to act always in the line of the centre of gravity, or the line of the axis of the lifter. There was a beautiful collection of stamps at the Exhibition of 1862, and some of these were fitted with double cams for this purpose. The single cam, however, has the advantage of allowing the axle to be placed nearer the stamp stem, and thus permitting a greater number of blows to be struck per minute. As a rule, the quantity of material got through by stamps is surprising. In some of the Cornish mines the number of heads at work ranges from 12 to 40, the latter being considered an important mill, but the larger tin mines go far beyond that. I have seen 90 heads in a row, and in one or two mines no fewer than 150 heads are constantly at work. From 30,000 to 100,000 tons may be the quantity of material to be dealt with at one time, and from this you will see that the scale on which these crushing operations are carried on must be immense.

The kofer originally in Cornwall was simply a strong structure of wood, strengthened with bars of wrought-iron, and having a plate of cast-iron at the bottom. The sides were of such a height that the material would not slush out, and the bottom or bed on which the material is to be crushed varied from a few inches to 14 in. square. The middle part, called "the die," is raised a little to act like an anvil. In this country now the hardest "capel" that can be procured is used. In California the battery-box, as it is called, is generally composed of one solid casting, and usually receives either four or five stampers. The order in which they give their blows is not always the same in all mills, but in most instances the first blow is struck by the central stamp. This is followed by the outside one to the right: then by the second to the left: afterwards by the second to the right; and finally by the stamper on the extreme left of the series. In Cornwall (taking the stamps by their numerators, 1, 2, 3, 4, 5) they frequently have this sequence, 1, 5, 3, 2, 4; or 1, 3, 5, 2, 4. The object of this is to equalise the strain on the machinery, and its operation on the material.

For the outlet a grating is provided; it consists of bars made of fine tough sheet iron, with holes so small that there are from 150 to 300 in some cases to the square inch. Through these the material passes when it is sufficiently comminuted. Capt. Tregony, at the mine of Tregony, near Redruth, brought forward an improvement in which he sought by enlarging the area of grated surface, and altering the shape of the kofer to give an easier discharge to the material. Another system is that of an overflow instead of a grating, so that not until the tin ore or gold ore is pounded to a sufficient fineness, will it be lifted up to the flush.

The feeding is done by a simple apparatus generally at the back; it consists of a hopper, with an inclined descent towards the kofer, which, although self-acting, requires some attention from the millmen who look after the stamps. It has been suggested that it would be better to have one large head, like the Nasmyth hammer, and an apparatus of this sort at Lake Superior is said to be doing a great deal of work most effectively. One of the most ingenious of this class of apparatus is that introduced and patented by Mr. Husband; it is called "Colvais and Husband's stamps," and the blow is given by a pestle as large as six heads; it is said to be effective, but I have not seen it at work.

The number of strokes given by the heads varies from 45 to 60 per minute, and they will stamp 1 ton in 24 hours per head. Of course, this depends (as we had occasion to mention in the case of rolls) upon the nature of the stuff. At Nevada they have an apparatus which gives from 60 to 100 blows per minute. The question as to the amount of work to be done is one which yet awaits careful investigation, and when a mining engineer is engaged to erect new mills of this kind, he ought to be thoroughly conversant with what has been done not only in England, but in other countries.

PREVENTING LOSS IN COKE OVENS.

IMPROVEMENTS IN TREATING GASES AND FUMES.

After the careful analysis of eighteen samples of Newcastle coal, Dr. Richardson stated the average contents to be—Carbon, 82·15, equal to 16 cwts. 1 qr. 20 lbs. per ton; hydrogen, 3·31, equal to 1 cwt. 6 lbs. per ton; nitrogen, 1·35; sulphur, 1·24, equal to 27 lbs. per ton; oxygen, 5·9; and ash, 3·7: and he says that 5 tons of the above coal makes 3 tons of coke, containing 93 per cent. of carbon, equal to 18 cwts. 1 qr. 19 lbs. of carbon per ton of coke. The 5 tons of coal, therefore, contain 4 tons 2 cwts. 16 lbs. of carbon, whilst the 3 tons of coke obtained from it holds but 2 tons 15 cwts. 1 qr. 1 lb., so that the loss in coking is equal to 1 ton 6 cwts. 3 qrs. 15 lbs. of carbon. The 5 tons of coal contains also 590 lbs. of hydrogen, equal to 111,500 cubic feet, which is all lost in the process of coking. Taking these facts into consideration, Mr. Brereton Todd, of Newcastle-on-Tyne, has been giving his attention to the question of utilising these and similar products, now wasted, by one comprehensive process. He remarks that the carbonic acid from the combustion of 3 lbs. of carbon, when passed in its heated state through red-hot carbon, absorbs 3 lbs. of carbon and 7200 thermal units, and forms (when cooled to 60° Fahr.) 188 cubic feet, or 14 lbs. of carbonic oxide. The combustion of 1 lb. of carbonic oxide disengages 2400 thermal units; the 14 lbs. will, therefore, give 33,600 thermal units; 1 lb. of sulphur, or 11·8 cubic feet of sulphur vapour, with 1 lb. of oxygen, or 11·8 cubic feet, form 2 lbs., or 11·8 cubic feet, of sulphurous acid when cooled to 60° Fahr. When this sulphurous acid in its heated state is passed through red-hot carbon the sulphur is obtained in the state of vapour, and 23·6 cubic feet of carbonic oxide formed. He further explains that during these transformations a quantity of heat is absorbed as latent heat, and that by using the transformer this heat is supplied from the waste heat of the furnace.

By the improvements which Mr. Todd has patented, he proposes to convert the gaseous products of combustion whilst still highly heated into inflammable gases for re-burning. This he accomplishes by passing those products through coal, coke, charcoal, or other carbonaceous substance, heated by the waste heat from the combustion of the fuel, which escapes with the products of combustion from the furnace in which the heat is employed, and when the waste heat is not enough for the absorbtion and transformation of the gases he increases it by the heat developed from the combustion of some of the carbon through which the gases pass, by allowing a quantity of air to enter. The carbonic acid in the gases is converted into carbonic oxide, forming an inflammable gas ready for burning again. He causes the gases and fumes to pass through a "transformer," which is a chamber, of suitable size and form, containing carbonaceous matter, placed close to a furnace or oven. When a reverberatory furnace is employed he prefers having it the length of the inside end of such furnace, 1 ft. to 1 ft. 6 in. wide, and about 6 ft. high, with sufficient openings left in the bottom, where it joins the furnace, to allow the gases and fumes to pass through. From the top or upper part of the sides it is connected with a flue, which leads away the transformed gases to the gas-furnace, or to where they are required for burning. A few openings should also be left as near the bottom of the transformer as possible, for stirring, taking out clinkers, and admitting air where a certain amount of combustion is required to be kept up in the transformer; but from the upper part of the transformer air is carefully excluded. When not in use the openings near the bottom of the transformer may be closed with a door, or by other means. Enough carbonaceous matter is put into the transformer to ensure that when the apparatus is at work there shall be about 30 in. of red-hot fuel for the gases to pass through; the quantity required will vary to some extent according to the size of the pieces, its solidity, and also according to the power of the draught passing through the transformer. The transformer may be made with any material that will stand the heat, and allow of its being made air-tight above the fuel. No air, or as little as possible, must be allowed to mix with the transformed gases, therefore the fuel required from time to time to replace that consumed in it should be introduced through one or more hoppers, placed either on the top or sides of the transformer.

When the furnace to which the transformer is attached is heated with coal, coke, or charcoal, on first lighting the fire he does not pass the products of combustion through the transformer, but through a separate heating-up flue, and this he continues until the furnace is red hot. He then closes this flue with a damper, and causes the gases to pass through the transformer. When inflammable gases are used for heating the furnace, he passes the gases arising from the combustion through the transformer at once. When the fuel in the transformer becomes red-hot the gases passing through it will be transformed, and in a state for re-burning. The carbon absorbed in the transformer during the transformation of the carbonic acid in the gases produces double the quantity of carbonic oxide to what it would if burnt directly into carbonic oxide. Any carbonic acid arising from the combustion of carbon promoted by admitting air into the bottom of the transformer will be converted in passing through it into carbonic oxide. The products of combustion from a boiler or retort-furnace he passes through a converter in a similar manner, and so prepares them to be used as gaseous fuel. He proportions the size of the transformer to that of the furnace from which it receives the products of combustion, so that the velocity of the gases in their passage through the transformer may be, if possible, somewhat less than it is in the flue leading away from the transformer. When coal is used for heating the furnace a certain portion of the gases of combustion consists of vapour of water from the air, and that formed by the hydrogen in the coal. When coke is used for heating the furnace they will contain the vapour of water from the air and the water which was contained in the coke. In passing the gases through the transformer this vapour is decomposed into hydrogen and carbonic oxide. The carbonic acid is converted into double its volume of carbonic oxide, and the gases are enriched by the hydrogen driven off from the coal consumed in the transformer when coal is used in it. The gas-furnace in which the transformed gases are burnt as fuel is placed at any convenient distance from the transformer, and so that the workmen may have free access to it on all sides.

The improvements also relate to the treatment of the gases arising from the manufacture of coke from coal, which have hitherto been wasted, and consist in treating them in the same way as for the treatment of the gaseous products of combustion, by which process the gases are obtained in an inflammable state for burning. When the transformer is attached to coke-ovens, he prefers having them so placed that in a set of four an opening in the corner of each shall meet in the centre of the block, over which he places the transformer, so that the gases from all may pass through it, and the charging of the ovens is so arranged that two or three of them may be at a red heat during the drawing of one charge and putting in of another. A large quantity of inflammable gases are driven off from coke-ovens with the products of combustion; by transforming the latter we obtain all in an inflammable state. In all cases where the fuel used in the transformer is too compact to allow of sufficient draught through it, I create sufficient, by drawing away the gases from the ends of the flues or condensers by the use of an exhauster, by which means the inflammable gases may be forced in any direction for burning.

In the treatment of the acids and fumes arising from the calcining or smelting of sulphides and sulphates, he proposes to deoxidise the said acids and fumes, by passing through coal, coke, charcoal, or other carbonaceous matter, heated by the waste heat from the furnace, assisted, when required, by the combustion of a certain quantity of the carbonaceous matter through which they pass. The deoxidised fumes are then to be conveyed through flue chambers or condensers, in order to condense the sulphur and any sulphides contained in them. The transformed gases of combustion after the sulphur and any sulphides are condensed will be fit for re-burning. In conducting this process, he passes the gases and fumes generated in the furnace through the transformer, and then conveys the transformed gases and sulphur and other vapour through large flues or condensing chambers, until the latter is condensed, when the inflammable gases will be fit for burning; or he passes them through a condenser, packed with brick, coke, or some such material, with water falling down it, to wash out the sulphur and any sulphides that may be present, and allow the water to run into a receptacle for the sulphur and other condensed matter to settle, when the water may be used again.

Sulphur and arsenic (when present) are contained in the gases of combustion as sulphurous or sulphuric acid and arsenious acid, and, when deoxidised, obtained as sulphur or the sulphide of arsenic. In the treatment of the fumes arising from the smelting of the sulphides, sulphates, or arsenides in a blast-furnace, instead of allowing air to enter at the charging or other places, as is usual, and thus causing the formation of oxides, acids, sulphates, and so on, he prevents any air entering by charging through a hopper or other equivalent means, and thus prevents the oxidation of the fumes, and obtains an atmosphere of carbonic oxide and nitrogen in the flues, condensing chambers, or condensers, through which he passes the fumes, in order to condense the sulphur and arsenic, after which the gas will be fit for burning. When a door is used for charging, it is not possible to maintain an atmosphere of carbonic oxide and nitrogen in the flues, chambers, or condensers, for as soon as the door is opened the carbonic oxide and nitrogen are driven out of the condensers, and lost, being replaced by air, which oxidises a portion of the fumes. In the treatment of the fumes arising from the reducing or smelting of oxides, such as those of lead, tin, antimony, copper, or zinc, he deoxidises such oxides contained in them as are reduced to metal at the temperature obtained by the process, which he accomplishes by passing them through a carbonaceous substance as above described for the fumes arising from the calcining or smelting of sulphides or sulphates, by which process he obtains the carbon consumed in their reduction in the state of carbonic oxide, mixed with the transformed gases of combustion, for re-burning. When a furnace to which a transformer is attached is used for reducing or smelting oxides, the transformed products of combustion will be enriched by the carbonic oxide formed with the oxygen given off during the process of reducing or smelting the oxides. Any oxides in the fumes reducible at a red heat will be deoxidised, and those not so reducible will be retained among the fuel in the transformer, and found in the ashes.

TRIAL OF PUDROLYTHE AT MINERA LIME ROCKS.

A number of interesting experiments with Pudrolythe, a newly invented explosive, which promises to be of great value to owners of quarries, lime rocks and mines, took place at Minera last week, a large number of gentlemen having been invited to witness the tests to which the compound would be put by Mr. Lester, and Mr. Shepherd, manager of the Minera Lime Rock Company. Among those present were the following:—Mr. J. T. Raynes, Rock-park, Birkenhead; Mr. L. Hardman, Birkenhead; Mr. W. H. Tilston, commission agent, Wrexham; Mr. Isaac Williams, Trevor Rocks, Llangollen; Mr. John George E. Crofton, mining engineer, Ruabon; Mr. John Harrison, lime merchant, Minera; Mr. R. V. Kyrke, Nantyffrith; Mr. B. Bell, Broughton; Mr. Wm. Rees, Whiterock-street, Liverpool; Mr. J. J. R. Poch, jun., Brussels, son of the inventor; Mr. W. K. Mason, jun., London; Mr. C. R. Cowap, lime merchant, Chester; Mr. Wm. Shone, jun., Chester; Mr. W. Dew, Wellfield House, Bangor; Mr. A. Potts, director of the Foxdale Mines, Isle of Man; Mr. R. K. Tregellas, Sandycroft Foundry, Chester; Mr. John Paull, slate quarries, Llangollen; Mr. T. Savin, Oswestry; Mr. H. E. Taylor, mining proprietor, Aberystwith and London, who received the thanks of all present; Mr. Wilson, mining engineer, Wrexham; Mr. C. Shepherd, manager, Minera Lime Company; Mr. Charles James Gibbons, manager of Mr. Lester's lime works; Mr. J. Nicholls, agent, Minera Union Mine; Mr. Humphreys, Bryn-yr-Owen Colliery; Mr. J. C. McKie, Oswestry; Mr. T. Mason, sen., London, and Mr. C. K. Liversidge, manager of Hendre Lime Works, Mold.

The first test was that of placing a quantity of pudrolythe on an anvil and striking it with a hammer, but it would not ignite, although now and then sparks might be seen, and an attempt to fire it by means of a flint and steel also failed. A quantity was next thoroughly wetted with water, and dried over a smithy fire, and then ignited to prove that it had lost none of its properties by the process. It appeared to require considerable difficulty to light, and even then it was only consumed slowly, wholly without danger to bystanders. The party were afterwards led to Mr. Lester's lime rocks, where a number of blasts were fired in most unfavourable spots, and the result gave everyone the utmost satisfaction, distinctly showing the economy, strength, and safety of pudrolythe as compared with ordinary powder. At one of the holes a mass of rock weighing nearly 100 tons was loosened, but an adjoining explosion had not been so effective in consequence of too much of the material having been used, in this case the top of the ledge being very much shattered, whilst underneath remained comparatively undisturbed. In the instances where 9 in. of pudrolythe in depth was used, where 1 foot of powder would have been thought necessary, and where it was well rammed, the consequences were very surprising. Three charges were likewise ignited in a cross-cut of a level running into the rock, when it was proved beyond question, in the presence of several most experienced men, that the smoke which followed was far less dense than when gunpowder was employed, so that miners would have been enabled to resume their work a couple of minutes afterwards. The subjoined table will give more details with reference to the blasting, the quantity dislodged altogether at the middle rock being estimated at 200 tons:—

	Diameter of hole. In.	Depth of hole. Ft. in.	Depth of powder requisite. Ft. in.	Depth pudrolythe used. Ft. in.
1.—Top rock	4½	6 4	4 6	3 6
2.— ,,	4½	6 2	4 0	3 8
3.— ,,	4½	9 6	6 6	5 0
4.— ,,	4½	10 6	7 0	5 0
5.— ,,	3	7 0	4 0	3 6
6.— ,,	3	6 0	4 0	3 0
7.—Middle rock	3	6 0	4 0	3 0
8.— ,,	3	7 0	4 0	3 6
9.— ,,	3	6 0	4 0	3 0
10.—Cross-cut	1¼	1 6	0 6	0 5
11.— ,,	1¼	1 5	0 5	0 4
12.— ,,	1¼	1 0	0 2	0 3

Subsequently, the company partook of luncheon kindly provided by Mr. Lester, and presided over by Mrs. Gibbons and Mrs. Nicholls. After the inner man had been attended to, Mr. Taylor made a statement as to the advantages derived from using pudrolythe, speaking of its safety with respect to mines and quarries, it being a substance that would not go off unless wanted. He also referred to its cheapness, 36*l.* a ton, 7*l.* less than the price of powder, remarking that it being much lighter than powder, a foot in a hole did not represent the same weight as the same depth of powder, at the same time possessing strength 33 per cent. greater. Mr. Savin adverted particularly to the safety of pudrolythe, and was of opinion that if less had been used in the holes that day, the execution would have been greater. Mr. Raynes said nothing could have been more satisfactory than the experiments, and Mr. Crofton alluded to the blasts in the level, and the time that would be saved in a mine where pudrolythe was adopted in consequence of there being so little smoke. Mr. Shepherd observed that they were morally responsible for the lives of their men, and if they could get an article that would not explode in transit or handling, they were morally bound to obtain it instead of the dangerous powder. Pudrolythe was such an explosive, for he had seen a man thrust a lighted pipe into it without its igniting. Mr. Williams, Trevor, was of opinion that pudrolythe could be more safely used than any compound he knew of; and Mr. Mason, sen., and Mr. R. V. Kyrke likewise referred to the satisfactory results of the blasting that day.

Afterwards a visit was paid to the rocks of the Minera Company, in which 14 3-in. holes had been drilled and fired with pudrolythe, the consequences being if possible more gratifying to the spectators than what had taken place at Mr. Lester's rocks; and it was the general feeling that 3-in. holes were quite, as if not more effective than those of a larger diameter. The day's proceedings were brought to a termination by a box containing 25 lbs. of pudrolythe being put on a large fire. After a few minutes the compound became ignited, but it consumed itself gradually without even stirring its wooden case, and without the slightest risk on the part of the observers, some of whom stood within a few yards of it.

The experiments with Pudrolythe at Minera, on Tuesday, must be pronounced an unqualified success, and no one of the company could have, at the close of the proceedings, remained an unbeliever in the new explosive. The tests were of the severest character; blasting holes in the rocks of Mr. Lester were drilled in the most difficult spots that could be found; yet, with one-third of pudrolythe that would be requisite of ordinary powder, the results gave the utmost satisfaction, clearly proving in every respect that this strange compound will be of the greatest value to proprietors of mines, quarries, and lime rocks. It is not simply on the ground of economy that we would urge the adoption of pudrolythe, but on account of its great safety. If it were in general use, we should hear less of those frightful and death-dealing explosions which are constantly recurring as arising from powder. It was on Tuesday shown to demonstration that it was only with some difficulty that pudrolythe can be ignited at all, and no amount of concussion will cause it to explode. It was handled with impunity near fire, and a quantity was placed on an anvil and struck with a hammer, without the slightest danger; whereas if gunpowder had been subjected to such tests, some of the company would certainly not have lived to tell the tale. The conclusion arrived at by the gentlemen present, the experience and integrity of whom can be unhesitatingly relied upon, was unanimous in approving of the new substance; and we anticipate that it will ere long, in every case in which it can be applied, supersede all the extremely dangerous explosives now generally in use.—*Wrexham Advertiser.*

Gun-Cotton.—The re-erection of the gun-cotton works at Stowmarket has been commenced. The capital subscribed for the new company is said to be 40,000*l.*

Lithofracteur.—Messrs. Krebs and Co., of Cologne, write:—As the tunnelling through the St. Gothard must be considered as a national undertaking of vast magnitude, it will interest your readers to learn that the first order for 25 tons of lithofracteur has been given us, under our contract for supplying this explosive for the blasting operations. To form an idea of the work to be accomplished, and of the hardness of the stone to be cut through, it is supposed that, even with the use of this most powerful explosive, over 1500 tons will be required.

Coal in the Faroe Islands.—An expedition has been recently sent out from Copenhagen to the Faroe Islands to report upon the coal mines of the island of Suderoe, which have been for many years worked for local use. This expedition has returned, after a month's absence, and a report favourable to an extended working of the mines has been made by Mr. Johnstrup, professor of mineralogy at Copenhagen University, who was accompanied by a mining engineer from Silesia, and two working miners.

Preventing Explosions in Coal Mines.—At the Chemical Society, Mr. J. A. R. Newlands, after remarking that diminished atmospheric pressure was frequently the cause of explosion in coal mines, proposed to obviate this by having the up-cast and down-cast shafts covered by air-tight chambers, the one furnished with an outlet valve, and the other connected with pumping machines to force air into the mine; this might be done by air-pumps, or by a ventilating fan, or by a sprengel pump. In case of an escape of fire-damp, a diminished pressure might first be produced in the mine, and the liberated fire-damp subsequently expelled by driving a current of air through the workings. The Chairman said it was a matter of great importance and interest, not only to chemists, but to the public at large; the principle seemed to be a sound one, but he could not say whether the mechanical means would answer the purpose.

Royal Historical Society.—The object of this society is to deal with a class of historical subjects which, while they do not fall under the cognisance of the Archæological Institutions, have not been comprehended within the programme of other associations. The exact field which it is proposed to occupy is not very carefully defined, but it is mentioned that the stores of inedited materials in the Public Record Office, the British Museum, and the Bodleian Library, and in the public libraries and national depositaries of Scotland and Ireland are alone sufficient to induce the organisation of a British Historical Association. The society is stated to be constituted as a Royal Society by Her Majesty the Queen, June 28, 1872, but does not possess a royal charter. The treasurer and assistant-treasurer are officials of the Tottenham Court-road branch of the City Bank, and the honorary secretary and historiographer is a gentleman, at Lewisham. The list of members already contains about 250 names, including many who are well known in scientific circles.

Magneto-Electric Machines.—The invention of MM. Gramme and D'Ivernois, of Paris, consists in the applying and using in such machines of electro-magnets having consequent poles; and also in the use of rubbers composed of a number of wires united in the form of a bundle or sheaf, whereby they are less liable to become worn, and the production of sparks is prevented. This improved magneto-electric machine is applicable for all purposes where magneto-electric machines can be usefully employed.

Meetings of Mining Companies.

SOUTH PHŒNIX TIN AND COPPER MINE.

The fourth general meeting of shareholders was held on Thursday, at the registered office of the company, 7, Westminster-chambers, Victoria-street, Westminster,—Mr. J. R. MACARTHUR in the chair.

Amongst those present were Messrs. Hazeldine, G. Baylis, Peckover, Pearson, Marshall (directors), Moore, Hooke and Co., Sillifant, Jones, &c.

Mr. HENRY BROWN (the secretary) read the following report:—

"The directors have to report that 8225 ordinary shares have been taken, which, with the 2500 paid-up shares mentioned in the articles, will leave only 1275 shares unissued, which the directors have reserved until the result of the Grace Dieu lode, which is very promising, can be seen. Most of these shares the directors feel confident of being able to issue at a premium. The engine and machinery which had been purchased at the date of their last half-yearly report has since been erected, and is now at work pumping."

The following particulars respecting the works on the mine appeared from the report of Capt. Kelly, which was also presented:—

"Grace Dieu Lode—Pearson's Shaft: We have commenced to drive south from the bottom of the shaft (20) for the purpose of seeing the lode at this depth, and from the strong and masterly appearance the lode is presenting at surface, it is very probable that we shall find a productive lode when met with. The ground is very congenial for the production of mineral. We are pushing on the drivage as fast as possible by nine men; the water ie coming freely from the bottom of the lode, which I regard as a favourable indication that we are getting near the lode.—Greenhill Lode: The new shaft is in a regular course of sinking by nine men, and the men are making fair progress; the lode in the shaft is 1½ ft. wide, composed of peach, capel, and good saving work for tin, with great promise of further improvement as we deepen. The engine is working exceedingly well, and keeping the water in fork easily."

The balance-sheet to September 30, 1872, which was taken as read, stated that the amount received upon calls was 5755*l.* 9s., which, with sundries, made a grand total of 6148*l.* 1s. 4d. Against this was credited—By mining sett, 2500*l.*; law charges and fees, 148*l.* 4s. 2d.; machinery, 647*l.* 17s. 11d.; management and salaries, 992*l.* 7s. 8d.; sinking shafts and mine expenses, 792*l.* 9s. 3d.; buildings, 375*l.*; and sundry other payments: making a total of 5720*l.* 12s. 7d., and leaving a balance in hand of 477*l.* 8s. 9d.

The CHAIRMAN then said that since the last meeting they had succeeded in setting up the engine, and from the reports of the manager and Mr. Kelly they had the prospect of very shortly realising good results. Besides this they had now much additional information up to the present time, which the secretary would presently read. The principal duty of the directors at this meeting was to present the half-yearly account, and to receive the suggestions and criticisms of the shareholders upon them, and upon their conduct since the last meeting. He was, however, happy to say that they had now obtained the opinion of distinguished miners on the spot, and that those opinions were most satisfactory both as to the present and future of the mine.

After a satisfactory explanation elicited by a question from Mr. Peckover—

Mr. MOORE complained that the balance sheet did not show the amount of plant. At the last meeting the sum set down for machinery was said to be sufficient, and now it appeared that nearly 200*l.* had been added to that amount.

Mr. PECKOVER thought Mr. Moore had made a mistake. It was distinctly stated at the last meeting that the machinery must be reckoned at 800*l.*, and the probable cost thus stated had not yet been exceeded.

Mr. HAZELDINE remarked that the sum of 425*l.* was put down for machinery, but it was necessary to erect a house for its reception. The whole amount did not reach 700*l.*

Mr. PEARSON mentioned that at the last meeting the cost of machinery was stated to be 800*l.*, and it was quite true that at present the amount shown to be expended was only 647*l.*, but there was a bill to come in for a new cylinder and ether matters amounting to the sum of 150*l.*

Mr. MOORE asked if any more buildings were required?——Mr. PEARSON replied in the negative; a small sum of 10*l.* to 15*l.* might be yet required, but that was all.

Mr. PECKOVER wished to explain that at the board meetings the directors had brought before them what was called the cost-sheet for the previous month. That included wages, merchants' and tradesmen's bills for materials supplied, and so on. At the time the balance-sheet was drawn out there was an item of 411*l.* 2s. 4d., which was now paid. As to calls unpaid, put down at 100*l.*, there was now only 37*l* on calls not fully paid-up. With regard to the expenditure for machinery, it was a matter of importance to note that on their engine, for which they gave 425*l.*, they had since been offered 150*l.* bonus. The directors, therefore, thought they had made a good bargain, and well looked after the interests of the shareholders.

Mr. MOORE asked if the workmen at the mine were paid by piecework?

Mr. PEARSON said that the materials were provided by the company, but that the work was done at 2s. 9d. or 2s. 10d. per perch. He might add that in buying the plant they had saved more than 500*l.* For instance, the pumps, which had cost 5s. per cwt., were now worth 8s.

Mr. HAZELDINE: If the hon. proprietor would go and see the engines and machinery he could not help but be satisfied with the money paid for them. They would be glad to see anyone down at the mine; and if shareholders thought fit to criticise what had been done, they had only to go down and see what had been done at the adjoining mines, and they would find that double and treble had been paid for no larger an amount of machinery and work.

Mr. MOORE claimed the right to criticise.

Mr. HAZELDINE: We invite criticism. The closest enquiry will show that for what we have paid 600*l.* there has been paid on the adjoining property no less than 1500*l.* For himself, he should be happy to go down at his own expense to meet Mr. Moore, or anyone else, and assist them to investigate the whole of the works, and the real prospects of the adventure.

Mr. MOORE said that from the balance-sheet it appeared that over 6000*l.* had been spent, and more would have to be spent. The people who had embarked their money in this company were not rich, and they were—as he himself was—hoping to get something back for their money. Expenditure, therefore, was a matter to which shareholders always ought to give their best attention. He had always found in carrying out works—and he had had to do with large numbers of men—that the cheapest plan was to put the men on piece-work. They would work better in that way than by the day. He hoped when they met again six months hence that there would be no cause to complain either of their expenditure or their prospects. He was prevented by a death in his family from going down when the opening of the engine took place, but he hoped that very soon, with all this pumping, winding, digging, and exploring, something would be brought up which would be profitable to the shareholders. (Cheers.)

Mr. PECKOVER said that although full accounts had appeared in the *Mining Journal* of what had taken place when they went down to the opening of the engine, Mr. Moore had, he found, not had the advantage of reading them. If he had he would have seen that a number of gentlemen, well up in mining, but not personally interested in this enterprise, had expressed themselves in the highest terms of satisfaction as to the prospects of this adventure. With regard to the present expenditure, Mr. Moore would find on analysing the balance-sheet that including all the preliminary expenses, and with all the machinery paid for, the expenditure had been really only 3668*l.* on the mine itself, and that they had a good round sum to go on with.——The SECRETARY, at the request of the Chairman, then read the following document:—

Nov. 18.—Since our report of April 3 last, Pearson's shaft, on Grace Dieu lode, has been sunk 6 fathoms, making the present depth 20 fathoms 1 foot. We have fixed a 20 fathoms plunger-pole, sinking lift, and all the necessary pitwork. We have commenced a cross-cut from the bottom of the shaft with the intention of cutting through the lode, and up to the present time have cut into it 11 feet; before intersecting the lode we had to drive 10 feet; the first 4 feet of the lode is composed principally of peach, and containing tin that will pay well for stamping; the remaining part of the lode already cut through is a mixture of capel, also containing tin; this lode as far as seen at surface is 18 feet wide, and from the beautiful appearance the lode is there presenting we consider that the south or leading part of the lode has not yet been reached; we are pushing on this drivage with all speed by nine men. We have commenced sinking a shaft on Greenhill lode, which is about 35 fathoms north of Grace Dieu lode; the shaft is down 6 fathoms from surface, and the lode which has greatly improved in size and value since we commenced is now nearly 2 feet wide, and is producing splendid work for tin, and looking well for further improvement as we deepen; this also is a very promising lode indeed, and from present indications we believe will lead to great deposits of tin. We have nine men sinking this shaft. We are pleased to inform you that the engine started on the 11th ult., and continues to work in a most satisfactory manner; we would here mention that since the last meeting of shareholders, besides removing and erecting the engine, and putting in the boiler, we have built the new engine-house and stack, boiler-house, loadings for the fly-wheel shaft, and have completed all the work necessary to connect the fly-wheel shaft with the shaft-bob, such as rods, pulley-stands, &c. We have also taken out a small reservoir to contain water for the supply of the engine. It will be desirable to erect stamps without loss of time, and we are now making every enquiry as to the best description of stamps to be used, and shall as soon as possible send you on our report, with a report of our engineers, Messrs. Loam and Son. In conclusion, we need merely say that as far as the mine is already developed it is opening out beyond our expectations.—CHARLES PEARSON (Managing Director), JAMES KELLY (Agent).

The CHAIRMAN then moved the adoption of the report and balance-sheet.

Mr. HAZELDINE, in seconding the resolution, begged to call attention to the fact that, out of the 6168*l.* 1s. 4d. expended, the whole sum laid out on the mine, including premium paid on shares, was 2812*l.* 6s. 1d. Some of the charges, too, were incurred before the present board of directors was constituted, but they were bound in honour to pay them. They must, however, expect to have a larger expenditure before they could bring any ore to market, as they would want dressing-floors and stamps. For this it probably would be necessary to lay out 1000*l.*, but they might depend upon the directors exercising their best judgment to limit the expenditure. Indeed, on the question of stamps they were now engaged in anxious enquiries. Besides his knowledge of experiments now going on at certain mines in the neighbourhood of St. Just, he had been a day or two ago here in London, to see a new arrangement of stamps. The other directors shared his anxiety, and as they all understood something of these matters the shareholders might feel certain that their money would be well laid out. They were working without fee or reward now, and if the enterprise were unsuccessful the directors would not get, and, indeed, did not expect, one copper; but if the mine paid, and they had no doubt about it, they should expect to be recouped the money they had been out of pocket. (Hear, hear.) He believed that a very few months would prove the mine to be a great success. He was not alone in that opinion, for it was shared by most of the practical men resident in the district. He knew for a fact that the manager of one of the finest mines in that neighbourhood was sent down from Tavistock to secure this very sett, and every man who knew the district corroborated the opinions given of their property by their captain and the managing director. (Hear, hear.) Stones of tin had been found at 2 fms. quite equal in richness to those found on the neighbouring properties at 210 fathoms; and even their "peach" was found on assay to have 71 lbs. to the ton, while the Phœnix lode had but 20 to 26 lbs. The mine had, in fact, got beyond the limits of speculation, and they might look for a good solid profit. It only required time and a little patience to make it the finest mine in the county of Cornwall. (Hear, hear.) He believed that in the six months Mr. Moore had named this mine would make returns equal to any in the district. (Hear.) Of course, circumstances might occur to make progress less rapid than might be expected; but if Mr. Moore and his friends had been down to the place——

Mr. MOORE: We hope to go down next spring.

Mr. HAZELDINE hoped they would. When he was down there everybody he spoke to gave this sett a high character. A shareholder who went down not long ago without saying what his interest in the mine was, and nearly got drowned in the shaft, came back with the fullest belief in its future prospects. (Hear.)

Mr. PECKOVER believed Mr. Hazeldine had over-estimated the sum that would be required for stamps. He thought that three stamps, at 75*l.* 4s. each, would enable them to send a good amount of tin to market. He had brought a stone from the lode and submitted it to a distinguished analyst at Northampton, and he found that the metal in it represented 1 ton of tin in 5 of the lode. This stone was got at 2 fms. from the surface in the Greenhill lode; and when he mentioned that in the adjoining property they had realised 335,000*l.* for 20,000*l.* of capital, with 28 lbs. of tin to the ton of ore, he need hardly dwell upon the excellence of their prospects. When they had got the stamps there would be a good pile of productive material ready to submit to their operation. (Hear.)

Mr. PEARSON (the managing director) said that the weather had been already alluded to in previous reports, and he had not thought it necessary to mention it in those read that day; but the remarkable wetness of the season had been much against their operations. Their neighbours of the Phœnix, however, who had started first, did not expect to get into the market before Christmas; and, therefore, as to time this mine had beaten them. Speaking of assaying, he was glad to be able to state that they had tested stones which yielded 8 cwts. to the ton, and, indeed, in some parts of the lode it was even better. Indeed, all the best judges were surprised to find it so good at so shallow a depth. Even the capels yielded 25 or 26 lbs. to the ton, and some of them more than that. With regard to the six months that had been mentioned, he thought they would be unwise to be in too great a hurry to decide as to the stamps they would set up. The old system had now been to a great extent given up, and there were two or three new ones being erected at mines near them for trial. As their prospects were so good, they could well afford to wait, and see which proved the best.

Mr. HAZELDINE said there were two competitors now being tried one against the other—Willoughby's and the Pneumatic—at a mine near St. Just, with which he was connected, and there was a third—"Walker's Universal"—which might prove better than the other two. It was better, then, that they should see which was best before laying out their money. (Hear.)

The CHAIRMAN said he was always glad when shareholders asked questions, as it showed they took an interest in the affairs of the company. The directors had, however, already given much anxious consideration to the matters thus enquired into, although probably they were not alluded to in the reports. He wished to bear testimony to the fair and proper way in which Mr. Moore had put his questions; and he felt that gentleman must be satisfied with the open and candid way in which they had been answered.

Mr. SILLIFANT moved, and Mr. MOORE seconded, a vote of thanks to the Chairman and board of directors, which was put by the secretary, and was carried unanimously.

The CHAIRMAN, in acknowledging the compliment, said that he had never worked with a board of directors more anxious to further the interests of the shareholders or more willing to give time and attention to the business of the company. In most other companies the Articles of Association provided for the remuneration of the directors. Any such provision in their articles was conspicuous by its absence. (Hear.) The directors were, therefore, trusting to their successful operations for remuneration. If the enterprise was unsuccessful they would have nothing, but if, as he believed it would prove, the mine was a great success, he felt sure the directors would have no cause to regret that their remuneration and the reimbursement of moneys out of pocket had been left to the shareholders. (Hear.)

The proceedings then terminated.

GREAT NORTH LAXEY MINING COMPANY.

An extraordinary general meeting of shareholders was held at the company's offices, Austinfriars, on Wednesday,

Mr. W. C. BULLER in the chair.

The LONDON MANAGER read the notice convening the meeting, and the directors' and agents' report were submitted.

The directors reported their regret that they had been compelled to call an extraordinary general meeting of the company to report that the mine could not continue to be carried on unless further capital were provided. Capt. Rowe's report, subjoined, will explain the cause which has led to this unfortunate position. The directors thought it right to mention that they had reason to believe the mine would not, under any circumstances, be abandoned. There were parties who had confidence in its ultimate success who were ready to carry it on. Under these circumstances, it was for the shareholders to consider whether they would make an effort to retain the property, and provide the necessary funds to develope it properly, or whether they would allow it to be disposed of through the process of a liquidation of the present company. The directors estimated that the net balance of liabilities to the end of November, in round numbers, at 750*l.*, against which there was the plant and machinery. There were 368 preference shares unissued.

Nov. 15.—Since the general meeting in April last we have cut out trip-lodge at the 110, sunk the north shaft below the same 10 fms. 1½ ft., put in timber for collar, sheeting, &c., and driven the 121 north and south 4 ft. each way. The lode in the 121 is about 3 ft. wide, and consists of rock and spar, intermixed with small pieces of lead, but not sufficient to enable us to give it a value. The 110 end north has been driven since last meeting 14 fms. 3½ ft., and has not been so productive for lead as we expected; in the roof of the driving of late the lode has been looking well, worth 1 ton of lead per fathom, and continues so up to the present end; we are now rising in this ore ground to hole to sump which is being sunk to the 96, or level above, now down 9 fms. The lode in the north end of this sump now looks well, and is worth quite 1 ton of lead per fathom. We have two stopes in the roof of the 69, worth from 10 to 15 cwts. per fathom. The lode in the roof of the 84 is not so good as when last reported on; its value is about ½ ton of lead per fathom. The stopes in the 73 fathom level are worth from 10 to 15 cwts. of lead per fathom. The 60 end south has been driven 9 fms; the lode is 4 ft. wide, and composed principally of hard rock and quartz. In this end we have had an unceasing flow of water, which is a strong indication of open ground, and very like an ore bearing lode somewhere ahead. If asked whether I consider the mine worth further prosecution or not I feel bound to answer in the affirmative, and notwithstanding all the past disappointments, I, for one, would not like to abandon the mine without driving out the 121, or bottom levels, north and south, the 110 further north, and the 60, especially south, towards the Great Laxey. When my report to the shareholders was written, in April last, the lode, which promised to be a distinct or new one, intersected, as it had been some months previously, by a cross-cut in the 38, looked exceedingly well; had the ore then in sight in each direction held on and continued the mine would now, to say the least, have been able to provide for itself, but I regret the fact, shortly after the meeting the ore both in the drivings and stopes cut out almost entirely, thus upsetting all calculations which I felt justified in making from the appearance of the mine previous to, and at the time of, the last meeting of shareholders. We have 12 tons of lead on the floors dressed and undressed.—R. ROWE.

The CHAIRMAN had very few words to say as to the position of the company, and Capt. Rowe would explain the state of the mine. He regretted that they were in the same position as they had been before when they met together, and that the mine was not making profits. When they took power to issue the preference shares they believed that the amount raised would be sufficient to bring the mine into a paying position, but he was sorry to say that they had been disappointed. They had expected that at least half the expenditure would have been met by the returns, instead of which, in the six or seven months they had sold only 55 tons.

Mr. STORR enquired whether they had done as much stoping as possible, so as to endeavour to make the returns meet the outlay?——Capt. ROWE said that they had. He would only have brought the company under greater liabilities if he had taken out more ore. They could get about 10 tons a month at present, and that quantity did not pay. They were getting some ore in the work they were doing, but they were compelled to do the work to open out the mine.

Mr. MURCHISON remarked that it was always necessary to carry on exploratory operations in a mine, and that it was an advantage to obtain some returns, even if they did not pay the whole cost of development, because it proved the ground, and might lead to fresh discoveries.

The CHAIRMAN explained that the 60 fm. level was going towards Great Laxey, and the appearances were certainly as favourable as they could be, failing the presence of lead.

Mr. TURNER understood that the 7500*l.* was subscribed for deepening the mine, as it was well known that the mines in that district improved in depth, and it seemed to him that they could not have spent 7500*l.* in two years in sinking 20 fms.

Mr. MURCHISON said that he really must correct Mr. Turner's figures. When the preference capital was subscribed the north shaft was down to the 38; it was now down to the 121, and 65 fathoms of ground had been taken away by sinking and rising in that shaft during the time. The south shaft was down to the 110, but it was found that every fathom they sunk they were sinking away from the ore, and therefore the north shaft was proceeded with, all which had been fully reported.

A SHAREHOLDER enquired what level in Great Laxey was at the same depth as the 60 in Great North Laxey driving towards that mine?——Capt. ROWE explained that they were in about 40 fms. higher grouud than Great Laxey, so that the Great North Laxey 60 fm. level and the Great Laxey 20 fm. level would be of similar depth. In Great Laxey, Dumbell's part was rich from surface. They had reason to believe that they would meet with cross veins between the two mines, and it was at these cross veins that they had obtained the riches in Great Laxey, and they did not think it would be far before they met one, because so much water was coming out. The sump from the 96 to the 110 was in good ore ground.

Mr. TURNER suggested that they might have to drive two miles to reach a cross vein, and maintained that there was nothing to justify the expenditure of any of the preference capital except in deepening the mine.

The CHAIRMAN thought the great question was whether Capt. Rowe had used his best judgment in working the mine, and that if he had done so what was the best mode of raising the necessary capital for carrying on operations.

Mr. TURNER would like to know the position of the preference shareholders?——Mr. MURCHISON explained that in case of winding up the preference shareholders had priority over the ordinary shareholders.

A SHAREHOLDER had seen a report in the *Mining Journal* from Capt. Waters, in which it was stated that there were 30,000*l.* worth of reserves in the mine.

Mr. PETER WATSON said that Capt. Waters' report was not made for the company; it was he who sent him to inspect, and upon the faith of his report he had bought a large additional number of shares; he was now about the largest shareholder. He had still full confidence in the mine, and had no doubt that if Capt. Waters said there were 30,000*l.* worth of reserves there was that amount, but he did not say how much it would cost to return them; the reserves would be returned when they could be raised at a profit, which might be soon or months hence. His object in sending Capt. Waters was to ascertain the similarity of the ground in their 60 and at the same level in Great Laxey. He was satisfied with the report, and bought 150 more shares at once. They had a lode worth 1 ton, 1½ ton, or 2 tons per fm., but it was in very hard ground. He considered they had been spending two years to reach the valuable part of their property. In his opinion they must prosecute the mine, but if it was the desire of the general body of shareholders to sink the shaft only it would be very easy for the directors to carry out their wishes, but he must say the 80 ought to be driven.

Mr. STORR did not complain of the stoping and driving, but merely wished to know the amount expended on the shaft.

Captain ROWE would say roughly between 3000*l.* and 4000*l.* He had persevered with the mine, and hoped it would be for the benefit of the shareholders. He had had the honour of bringing Great Laxey to profits, and found the ore very similar; he hoped, therefore, to bring Great North Laxey into profits. They could, of course, only tell the dip of the ore after the shaft had been put down, and everything had been done to get the mine into depth; but the 110 was so hard that they could not get on faster, although they worked the 24 hours round. They could not sink the north shaft until the 110 was up to it, and as, of course, their space in a level was limited they could not bring more than a certain number of men to bear. As to the present state of the mine, he would say that it was such that he would be sorry if the present shareholders left a chance untried. If the north shaft were carried down, and the 60 fm. level driven south, he did think that in one or the other they would get a good mine; but, seeing that there was no immediate chance for large returns, he would say the same as he had said to the directors—that they had better raise 10,000*l.*, and drive the 60 and 121, and sink the north shaft.

A SHAREHOLDER supposed the 10,000*l.* would last three years, and presumed they had some men working on tribute.——Capt. ROWE said that the tribute system was not understood in the Isle of Man.

The CHAIRMAN said they had heard Capt. Rowe's opinion, and it was evident there were but two courses open to them—either to wind-up or find the additional capital.

A SHAREHOLDER thought the directors should have told the shareholders what they proposed to do, for the directors usually had something cut and dried.——The CHAIRMAN said that was not their case: they had arranged nothing, but left the matter entirely in the hands of the shareholders. The directors would co-operate with the other shareholders whatever course they decided upon, the directors being themselves the largest shareholders.

Mr. STORR enquired what was the chance of ore in the north shaft?——The CHAIRMAN understood that there was no probability of ore in the shaft, as the lode dipped still more to the north, but that there was good ore at 15 fathoms north of the shaft.——Capt. ROWE said they could not drive more than 2 fathoms a month.

Mr. TURNER remarked that Capt. Rowe proposed to raise 10,000*l.*, and the only question was how it was to be raised?——A SHAREHOLDER suggested that the case should be stated to all the shareholders, and then an attempt be made to raise the money.

Mr. PETER WATSON explained that if they stopped working the men would be deprived of work and would go elsewhere, after which they could not hope to get them back again.

The CHAIRMAN would be inclined to wind-up voluntarily, and then determine how to raise the new capital.——A SHAREHOLDER would prefer to hear what they proposed to do.

Mr. MURCHISON would suggest, then, a course which had succeeded well in another company. They would wind-up voluntarily and form a new company, to which the mine would be sold for 10,000 shares of 2*l.* each (under sec. 161 of the Act of Parliament). The new company would consist of 15,000 shares of 2*l.* each. Of these, 5000 would be offered at 2*l.* each to the existing shareholders, and those who took the 5000 would receive the 10,000 as bonus; by this means the 10,000*l.* would be obtained, and if the mine prove profitable those who subscribed the new capital would receive the full advantage: in the other case he had mentioned nearly every shareholder had taken his proportion, and, owing to the improved financial position of the company, the bonus shares became saleable at par and upwards.

Mr. TURNER proposed a committee to consult with the board; and subsequently the CHAIRMAN moved the resolution, in order that Mr. Turner might be a member of the committee, but it was eventually resolved "That an independent mine agent be appointed to report upon the mine, and that another meeting be called within a month."

Thanks were then voted to the Chairman, and the meeting separated.

WHEAL KITTY (ST. AGNES) MINING COMPANY.

A general meeting of shareholders was held at the offices, Austinfriars, on Tuesday,—Mr. WILLIAM TEAGUE in the chair.

Mr. J. HICKEY (the secretary) read the notice convening the meeting, and the minutes of the last were approved.

The accounts showed a profit upon the three months ending September of 295*3l.*, and a credit balance of 371*4l.*

The report of the agents was read, as follows:—

Nov. 16.—There is no alteration in the sinking of the new shaft, which is sunk 7 fathoms under the 130; the same being off the lode. In the 130, driving west of shaft, the lode is worth for tin 10*l.* per fm. In the 130, driving east of shaft, the lode is worth for tin 15*l.* per fm. In the 118, driving west of shaft, the lode is worth for tin 10*l.* per fm. In the 118, driving east of shaft, the lode is more promising in appearance, and yielding good stones of tin. In the 106, driving west of shaft, the lode is worth for tin 12*l.* per fathom. In the rise in back of the 106 fathom level, west of shaft, the lode is at present worth for tin 15*l.* per fathom. In the winze sinking under the 118, west of shaft, the lode is worth for tin 11*l.* per fathom. In the 94, driving west of shaft, the lode is worth for tin 11*l.* per fathom. In the 82, driving west of shaft, the lode is worth for tin 7*l.* per fathom. In the 20, driving west of rise, the lode is worth for tin 9*l.* per fathom.—Old Lode: In the 90, driving east of engine-shaft, the lode is very kindly in appearance, and worth for tin 9*l.* per fathom. In the north adit level, driving west from the eastern boundary, the lode is more settled, but being near the surface we cannot expect much mineral. The mine continues much the same, and we shall continue to raise about our usual quantities of mineral.—WILLIAM TEAGUE, STEPHEN DAVEY, J. WILLIAMS.

The CHAIRMAN said that most shareholders were, no doubt, aware that an alteration had been made in the mode of the payment of the miners in Cornwall, and that the miners were now receiving wages for 13 instead of as hitherto 12 months in the year. To meet that additional month's mine cost an increased quantity of tin had been provided; but the merchants' bills were, of course, charged as heretofore from the first to the last of the month, so that at their next meeting the accounts would show 13 months labour cost and 12 months merchants' bills. Under these circumstances he thought they would be acting wisely by declaring upon the present occasion a dividend of 7s. 6d., and a bonus of 2s. 6d. per share as formerly, after the payment of which there would be left an increasing credit balance of about 806*l.* to meet the additional month's cost. After paying the dividend and bonus, and additional month's mine cost, there would be an increase in the balance of 180*l.*

Mr. GODDARD said they always seemed to have a large balance at banker.——The CHAIRMAN said the dividend had to be deducted from that balance.

Mr. GODDARD said there was a good balance left after the dividend was paid.——The CHAIRMAN said that the three months merchants' bills up to the end of September were paid to-day, and those for the three months ending December would be paid at the next meeting.

Mr HICKEY mentioned that the only liability was the dues on the ores sold during the past quarter.

A SHAREHOLDER inquired the amount of the dues?——Mr. HICKEY: 1-22d.

The CHAIRMAN said the costs of the past quarter could not be accepted as an entirely fair average, because it sometimes happens that an extra boiler, or other item, had to be charged, which increased the cost unduly.

Mr. GODDARD asked when the next level would be reached?——The CHAIRMAN said the shaft was now down 7 fms., and estimated it would take five or six months to get the shaft the required depth, after which a cross-cut would have to be driven two or three fathoms to reach the lode.

A SHAREHOLDER said both the report and accounts seemed highly satisfactory.

The accounts were passed and allowed, and, with the report, were ordered to be entered in the cost-book. A dividend of 7s. 6d. and a bonus of 2s. 6d. per share were declared.

Upon the proposition of Mr. T. E. W. THOMAS, seconded by Colonel CLARKE, a unanimous vote of thanks was passed to the Chairman for the successful manner in which he continued to develope the mine, and for his presiding on this occasion.

The CHAIRMAN having appropriately acknowledged the vote, stated that the mine was developing in a satisfactory manner. Shareholders should remember that the dressing-floors were in a very exposed potition, and that if there had been frost during the past three months a less amount of tin would have been returned; it was by taking advantage of the weather, such as it had been, that they were able to provide for the additional month's labour cost earlier than otherwise. He was very pleased they were able to present such a satisfactory balance-sheet, and he trusted they would go on much the same as hitherto for a number of years to come. (Hear, hear.)—The meeting then separated.

TRESELLYN TIN MINING COMPANY.

At an extraordinary general meeting of the shareholders of this mine, held at the Law Association Rooms, Cork-street, Liverpool, on Monday, to consider the advisability of confirming or rescinding the resolution (passed by the Chairman's casting vote) at the directors' meeting held at the company's offices on Monday, Nov. 4, for the appointment of a cousulting adviser to the company, three of the directors, with the concurrence of other large shareholders, urged the advisability of calling this meeting, which was largely attended.—Mr. E. CROSLAND, Chairman of the company, presided.

The notice calling the meeting having been read by the secretary, also the minutes referred to, a lengthy discussion ensued, which was fully entered into by most of the shareholders present; a letter was also read from Mr. W. Ward, of Crosby House, London (a shareholder), who had recently visited the mine, and spoke most encouragingly of the mine and its prospects, and advises the utmost attention to the adoption of proper management: many of the shareholders present asked if the mine had hitherto been conducted in accordance with the plans of the agents in charge.——Capt. HODGE, Mr. JOHN THOMSON, Mr. MARTIN BOUNDY, and Mr. ADAM MASON replied that unfortunately it had not been so, or the mine would have been in a much more forward state of development, and this was mainly attributable to the opposing directors, although the agents' plans had been coincided in by Mr. Mason, a gentleman of experience, and also by Mr. Martin Boundy, consulting mine agent, of Liverpool, another director.

Mr. MICHAEL WILLIAMS BAWDEN, general assayer of Liskeard, Cornwall, a large shareholder, and representing by proxy all the Cornish shareholders, strongly deprecated the conduct of comparatively inexperienced young gentlemen opposing themselves to men of long-recognised mining experience, as it must ultimately tend to impede progress, waste the company's funds, and prove dispiriting to the agents.

Mr. CURRIE and Mr. FELL, with others, intimated a desire to know if the mine had improved its prospects through the costeaning and other preliminary operations that had been carried out?——Capt. HODGE, Mr. MASON and others replied in the affirmative, and that shortly, when the old engine-shaft was cleared up (which will be commenced forthwith) that they fully expect to find an ore bearing lode, and one that would lead to profitable results, judging from the reports of miners and others who saw the lode in the bottom level, when it was but partially intersected at the close of the last working, and also from the ground previously developed by the adit level explorations.

Dr. CRAWFORD then proposed that at present there was no necessity for appointing a consulting engineer, but should it be deemed necessary, the services of a first-class agent be obtained, which was seconded by Mr. TALBOT.

Mr. COVENTRY moved an amendment, that this meeting approves of the action of the directors in appointing a consulting adviser to the company.

This was seconded by Mr. FRASER, another director.——On the amendment being

put to the meeting, it met with *no* support. The resolution was then put, and received the unanimous support of the meeting.

THE LOVELL MINING COMPANY.

The ordinary meeting of shareholders was held at the offices, Bucklersbury, on Thursday (Mr. WILLIAM CARPENTER in the chair), when the statement of accounts showed a balance in favour of the mine of 568*l.* 2s. 4d. The SECRETARY read the following report:—

Nov. 20.—The 12 is now opened for 33 fms. in length. The lode westward has recently been disordered by a crossing, but the ground driven since the last meeting has been worth about 70*l.* per fathom. The stope in back of this level is worth 60*l.* per fathom. The new engine-shaft is sunk 4½ fms. below the 12; it was at that level worth 70*l.* per fathom, but has steadily improved, and is now worth 150*l.* per fathom; and, as we do not carry all the lode, having no wall north and south, it is probably worth much more. The influx of water from the late heavy rains has compelled us to stop the sinking for the present. The adit is being driven westward as fast as possible by a full staff of men, and is likely soon to drain the water from the shaft, as the ground is improving, and we are evidently getting near the lode. We are now erecting a water-wheel, 24 ft. in diameter and 3 ft. breast, for pumping; it is only 70 fms. from the shaft. The masonry of the wheel-pit will be completed next week; and if we get the castings and other ironwork from the foundry in time the wheel, leats, flat-rods, and pumping gear will all be ready to work before Christmas, when the sinking will be at once resumed, and may be expected to proceed without let or hindrance from water. The water has increased for the stamps, which is now working regularly, and is, with the dressing machinery, in good order. It will be seen by this report that the lode improves greatly as we sink, and it never looked so likely to be permanent as it does now. The wheel now being erected is of sufficient power to pump the water for a considerable time to come. The expense of such pumping will be a mere trifle, and when required it may be applied to stamping. We have a good mine, and the best prospects of increased returns of profits.—J. NANCARROW.

The CHAIRMAN thought that his brother shareholders would agree with him in receiving the report as very satisfactory, both as to the present condition and the future prospects of the mine. (Hear.) The returns would have been larger but for the dearth of water to stamp with for some two months; but, as it was, the returns were very good, and they had a large quantity of ore at surface, with the stamps now in full work. He (the Chairman) moved that the statement of accounts and the agent's report be received, adopted, and printed for circulation amongst the shareholders.

The motion having been seconded, it was carried unanimously.

Mr. SHARPE next moved that a dividend of 4s. per share be declared, which was seconded by Mr. ANDERSON, and agreed to.

A vote of thanks concluded the meeting, which was in all respects a most satisfactory one.

CAFARTHA LEAD MINING COMPANY.

A special meeting of shareholders was held at their offices, New Broad-street, on Wednesday,—Lord H. BROWNE in the chair.

The report was taken as read.

The CHAIRMAN having explained the position of the company, stated that since the report was issued the adoption of a third course had been suggested—that all operations at the mine should be stopped, which had already been done, leaving things open in the hope that at some future day they would be able to raise the additional capital necessary, but it would be very difficult to do it at the present time. He then moved the adoption of the report, which was duly seconded.

Colonel STRANGE reviewed the reports of Mr. Williams and Mr. Tregoning, in which both agreed that there were certain portions of the mine that should be further prosecuted, involving an expenditure of 2500*l.* He then moved, as an amendment, that the directors be empowered to raise from the shareholders or the public a sum of money not exceeding 2500*l.*, in shares of 5*l.* each, such shares to have a preference dividend of 10 per cent. per annum, and after the reception of that dividend to share and share alike with the other shares; and that the directors shall convene a meeting six months hence to inform the shareholders of the failure or otherwise of the application.

The CHAIRMAN, in reply to a question, stated that he had written to Mr. Lavin to be present at this meeting, for having influential connections in Wales he (the Chairman) thought Mr. Lavin should be present; and having received a certain cash payment for the mine in addition to shares, he did think the shareholders had a certain claim upon Mr. Lavin for providing further capital.

After some further discussion the original resolution and amendment were withdrawn, and, upon the proposition of Mr. BISHOP, it was duly resolved that Mr. Lavin be invited to attend an adjourned meeting (the day to be fixed by the directors), and that the shareholdsrs be requested to forward proxies for such a meeting to Colonel Strange.

A vote of thanks to the Chairman and directors terminated the proceedings.

MALPASO GOLD WASHING COMPANY.

The second general meeting of shareholders was held at the London Tavern, on Thursday,—Mr. ALFRED COBBETT in the chair.

The report of the directors was taken as read.

The CHAIRMAN said the report really stated so fully the operations of the company since its commencement that there was very little necessary for him to add; every report received confirmed their views as to the valuable nature of the property, and left no doubt as to the success of the future. Their operations in the United States of Colombia were experimental, the principle of hydraulic mining being introduced for the first time, under certain conditions more favourable than in California, where it had hitherto been carried on, he believed, very successfully. The circumstances, however, by which they were surrounded in Colombia were in many respects far superior to those in California—the cost of labour was considerably less, although the quality was inferior, while the property was of such an extent as to render it practically inexhaustible, at least during the lives of the present shareholders. Not only the report from Mr. Clarke, but also those from every other person who had visited the property, although entirely unconnected with the company, had each entertained the highest opinion of its valuable character. Privately there had been received from Mr. Clarke information as to the value of the property, which it would not be wise for the directors to put in print, and so make themselves responsible for raising, perhaps, too sanguine anticipations. That gold had been found would be seen by the reports of their superintendent, for on Dec. 19 he wrote that "he had seen enough to satisfy him that the mine was a big one, and a good one. He felt confident that they had a very rich mine, and one that could be worked at great advantage." The country was near the equator, and subject to climaterial changes, and, the inhabitants being catholics, a great number of feast days were observed, which had caused much delay. On May 16 Mr. Clarke wrote—

"Of one thing the shareholders may be certain, there is no one living who will ever see the Malpaso property half worked out. It is one vast mine, from one end to the other, and I have never failed to get gold any place I have prospected, high or low. I shall wash into the hill at least 80 feet deeper than the old works, and shall, I think, get richer gravel than the Spaniards ever worked. And I feel as anxious as any of the owners to see the sluice running, and to know the result, though probably not so anxious about what the result will be, as I know it will be good, which they cannot know until they get the returns."

The property appears in every way applicable for the hydraulic principle, and it was only just to Mr. Clarke to praise him for the activity he had displayed in the company's service. The directors believed in Mr. Clarke's reports, as they said in the concluding words of their report:—

"They cannot but express their conviction that, when once washing is fairly commenced in new ground, the expectations hitherto formed as to the value of the company's property will be fully realised, in which conviction they think that no one who reads the reports of the superintendent will fail to share."

Some disappointment appeared to exist in regard to the last report from South America, arising, he imagined, from the fact that expectation had stood rather upon tip-toe as to the results of the application of the hydraulic principle upon this large extent of auriferous property, and some had, perhaps, strained their imagination too far, and because expected results had not come so speedily as anticipated depression had followed, but the directors saw nothing whatever to justify them in altering their opinion as to the great value of the property possessed by the Malpaso Company. (Hear.) and that the expected results must come if there was any truth whatever in the passages he had read from Mr. Clarke's reports. The country itself might be called all gold and silver. Humboldt, who, as everyone knew was not connected with any company, was a most independent witness that the country "was one mass of metal." It seemed that those large rivers which traverse the entire country, or their tributaries, largely abound in gold, and there was no doubt these grand deposits formed the beds of ancient rivers anterior to any known geological period. As he had said, the directors fully and thoroughly believed in the great value of the property, but they must look to the future to produce the results. A mail was due next week, but they did not expect full results by it, owing to the circumstances mentioned in the last report, that the old workings of the Spaniards would have to be cleared away before the new auriferous gravel could be reached, and that would take about two more "runs," or about 60 days. He might mention that the whole of the capital was subscribed upon the conditions stated in the prospectus, the whole of the purchase-money being taken in fully paid-up shares. The total amount expended to July 31, on which date washing was commenced, amounted to 5013*l.* 5s. 2d. This amount, representing the total outlay incurred in opening out the mine prior to the commencement of productive operations, the directors propose, with the sanction of the proprietors, to write off to capital account. By the adoption of this plan there would be a clear balance-sheet for the next year, with the expense incurred for bringing the mine into successful operation. He then moved that the report and balance-sheet be received and adopted.

Mr. J. T. P. PECHEY (director) seconded the proposition. When he last addressed the shareholders he pointed out that three conditions were indispensably necessary for the successful working of mines on the hydraulic principle—first, there must be a large deposit of auriferous gravel; second, an ample water supply; and third, good outlets to dispose of the tailings. He stated at that time that he fancied there might be in Malpaso some local conditions preventing the application of the hydraulic process; but he requested Mr. M'Lean (of Sweetland Creek), in whom he and many others had the most complete confidence, to engage a practical man, one thoroughly acquainted with the hydraulic principle. No practical hydraulic miner could possibly deceive himself in estimating the value of a property like this, but he might mislead if so disposed. Mr. Clarke had said that in Malpaso they had "a big and good mine," and produced other testimony as to the extent of the auriferous deposits, the ample supply of water, and the outlets. If they believed Mr. Clarke was an honest man (he did most thoroughly) there was an enormous fortune to be got out of this property. He (Mr. Pechey) could not see any possibility of failure. Although, probably, they had expected results at too early a date considering the amount of work to be done, yet he did look forward to a most successful future. (Hear, hear.)

The CHAIRMAN, in reply to questions, stated that dividends would be paid upon the whole of the company's shares, in accordance with the condition entered into with the vendors at the formation of the company. When 20 per cent. was paid to the ordinary shares the deferred shares would receive dividends *pari passu*.

Mr. O'REILLY (who had just returned from the mine) stated that the water could be applied for a face of half-a-mile and good results obtained from the present workings by doubling or trebling the hydraulic power. Mr. Clarke must soon get through the Spanish tailings, because they were not worked to any depth; he was now advancing towards a face of some 150 feet high, and the further he advanced the more ground was gained.

Mr. PECHEY explained that the nearer the outlet the deeper the tailings.

The CHAIRMAN pointed out that the Spanish workings had nothing whatever to do with the face, but it was found necessary to clear these away before successful working could be commenced.

Mr. O'REILLY said the Spaniards could not, with their rude appliances, touch the bed-rock, and in the lower portions the gold would, no doubt, be found in greater quantities than in the upper portions, where it was much more finely disseminated.—Mr. PECHEY, in reply to a question, stated that the average yield of gold from the auriferous gravel in California might be stated at from 10 to 50 cents per ton, and there was no doubt if they get 6d. a ton gross out of the Malpaso gravel it would pay remarkably well.

Mr. O'REILLY, in reply to a question from Mr. Thompson, said that the Spanish system was altogether inapplicable to hydraulic washings upon the extent contemplated by this company.

The motion adopting the report and accounts were put and carried unanimously.

Messrs. A. Cobbett and J. T. P. Pechey, the retiring directors, were re-elected.

Mr. H. L. Evans was re-elected auditor.

A vote of thanks to the Chairman and directors terminated the proceedings.

HUDSON GOLD MINING COMPANY.

The first ordinary general meeting of shareholders was held at the company's offices, Finch-lane, yesterday,

Mr. N. P. STRATTON in the chair.

The SECRETARY having read the notice convening the meeting,—the CHAIRMAN stated that the meeting was an adjourned first ordinary general meeting, held in accordance with the Companies Acts, and as was customary on such occasions he would briefly review the course the directors had pursued, and the progress that had been made at the mine. The company was formed in July last, with a capital of 50,000*l.*, of which 15,000*l.* was issued at the time of the formation of the company. The whole of this issue was taken up, leaving a reserve balance in shares of 5000*l.* for future contingencies. The realised capital, 15,000*l.*, was sufficient, it was estimated, to pay the vendor the 5000*l.*, amount of cash purchase money, and to provide sufficient capital for hoisting works and mill. The amount received on application was 3000*l.*, from which the vendor was paid 1000*l.*, and 1750*l.* had been remitted at different times to the mine in payment of wages, machinery, and materials for the hoisting works. The preliminary expenses have also been paid. They were remarkably small, the whole costs, including advertising, legal expenses, registration, books, &c., being under 90*l.*

Soon after the formation of the company in July last, Mr. Dunne, a member of the board, left this country for California to overlook the transfer of the property, and the avoidance of the usual delay in such matters was owing mainly to his presence on the spot. The solicitor employed to examine the title reported that it was perfect in the vendor, and free from encumbrance, and that the deed to the company had been recorded in the books of the county records. The deed has since been received, certified as recorded, and the United States' patent is expected within a few weeks. The most important question of the appointment of a manager was solved satisfactorily by the acceptance of that position by Mr. S. O. Brown, a gentleman of large experience in quartz mining, and the energy and promptness shown by Mr. Brown in pushing forward the machinery and preparing for active operations have met with the warm approval of the board. The whole of the hoisting machinery was expected on the mine early in last month, the necessary buildings having in the meantime been erected, and on the 12th inst. a telegram was received by the directors, stating that the hoisting works had commenced operations on the 8th inst. A few days from that time the mine would be unwatered, and sinking upon the lode proceeded with, so that reports may now be expected upon the lode.

Mr. Brown's intention of immediately sinking upon the lode to a depth of 500 ft. is evidently the best course that could be pursued prior to the erection of the mill, so that the ore supply may hereafter be kept well in advance of the milling operations. The profits in the prospectus were based upon $14 ore, but the successful workings at the depth of the "Gwin" and "Thorne" Mines in the same neighbourhood and on the same mineral belt warrant the hope that our ore will far exceed this estimate. The latter mine is paying $80 per ton, and the former $35, while, propably, the cost of working does not exceed $5 per ton. Arrangements have been made for the economical working of the mill and hoisting works by water-power, and the water necessary for these purposes has already been brought to the mine in pipes. The superintendent has also construoted a reservoir for storing and economising the water supply. A survey and location have been made of 5 acres of land in the neighbourhood of the company's property for a mill site, and a United States' patent has been applied for. This will become the property of the company without any expenditure, except the legal expenses and the Government fee. A spur of the Hudson lode, 1500 feet in length, has also been located in the same way for greater security. The directors are pleased to be able to inform the shareholders that the accounts of the mine they have received, since the formation of the company, strongly confirm the representations made at the time of the purchase, and they consider that the terms upon which the property has been obtained, and the moderate outlay required for preliminary work, and the economy with which the ore can be mined and milled will enable the superintendent to make the property remunarative at an early date.

The whole of the directors having retired, in accordance with the Companies Acts, were unanimously re-elected.

A vote of thanks was given to the Chairman.

BREMER MINING COMPANY.

The general meeting of shareholders was held at the company's offices, Old Broad-street, on Wednesday,

Mr. CYRUS LEGG in the chair.

Mr. W. H. WYON (the secretary) read the notice convening the meeting, and the minutes of the preceding one. The directors' report and statement of accounts, showing a cash balance of 829*l.* 15s. 1d., were then submitted.

The directors reported that only 4000 shares have been allotted, the remaining 1000 being reserved to be dealt with as may ultimately prove most advantageous. They have appointed Mr. Alfred Hallett manager of the mine, and hope to associate with him, as a committee of advice, two gentlemen resident in Adelaide, of considerable experience both in land and mining. The organisation of a good staff of mechanics, labourers, and miners has already been accomplished, and since March steady and continuous work has been going forward. In the first instance, the mine has had to be forked. The water having risen to the surface, and filled up all the levels, great difficulties have been encountered, but by letter, dated Sept. 7, Mr. Hallett writes—"At last, after another month's tedious work, we have succeeded in securing the 93 plunger, and feel great relief, as we may now fairly consider we have the water under control, and our liability to accident reduced to a minimum. After effecting some very necessary repairs, putting the shaft in order again, and clearing the boilers in succession, we can look forward to closing the forking account after another month."

On the mine, Capt. Prisk, the resident agent, reports—"We have four men driving on the main lode south at the 53, where we had lost the lode. In this place the lode appears to be making again, and, so far as we have gone, will pay for driving. We have four men driving south at 73, where the lode has also been lost. Here we have a small branch of quartz and ore, which we hope will lead to the lode. Should it do so, it will be a very valuable discovery, as we have a large piece of ground standing between this and the 53 to beat away. We have also four men driving north at the 33, on Boundey's lode. The lode is about 2 ft. wide, of rich looking yellow ore, and will yield 1½ ton of ore to the fathom. This end will pay well for driving."

It may be remarked that Boundey's lode is regarded with great interest, and, if expectations are realised, will add much to the character of the company's properties; and the use of Hancock's method of dressing ores will materially reduce the cost. The directors, confidently believing that these operations will result in early bringing of ore to the surface, are earnest in their efforts to secure profitable shipments as rapidly as practicable.

The CHAIRMAN said that with regard to the progress of the undertaking, he had but little to add to that contained in the report. They had held two *pro forma* meetings, one to confirm the appointment of the directors and the other to alter one of the Articles of Association, and of these the shareholders had heard the particulars. The report did not say much, but they must all understand that it would have been better for all of them if the operations at the mine had never been stopped; if they had been carried on either by the Worthing Company or themselves they would have been able to secure the full advantage of the high price for copper which had recently been ruling, for they must remember that with copper at 66*l.* to 70*l.* per ton the late company had paid its expenses. It was now 89*l.* to 90*l.*, so that every ton raised would leave a good profit. With regard to the operations at the mine, there was no doubt that they had a good manager in Mr. Hallett, who was one of the most practical men in the colony; he had been there many years, and had devoted a lifetime to mining, so that if anyone could make the mine pay it was he. They had their lifts of pumps in working order down to the 93 fathom level, and the water was forked to that depth. Their manager, at the date of the last advices, was raising ore, and he hoped that the next advices would tell them that returns were being made. This would lessen the drain on the company's funds. Since forking the water Boundey's lode had been worked upon, and would assist the mine much; he had no doubt that hereafter they would be able to get a good return for their money. He believed that not one of them went into this mine as a speculation; they all knew it, and went on with it as an investment, and as an investment he believed they would all find that it well answered their purpose. The shareholders would be benefited, and then he had no doubt they would take into consideration the question deferred at the last meeting—the remuneration of the directors. They obtained the mine at a very small cost, and had the further advantage that all the work down to the 103 was done for them. He was not aware that he had left any point unnoticed, but would be glad to answer any enquiry. He concluded by moving that the report and accounts be received and adopted.—Mr. MORRISON seconded the proposition.

A SHAREHOLDER observed that the Chairman had mentioned that they were actually raising ore, and he would be glad to know whether they were sending it to market and what was the produce.

The CHAIRMAN said that at the date of the last advices they had not made any returns, but would shortly be doing so. He presumed the produce would be about 10½ to 11 per cent. The Worthing Company had got the produce up from 9½ to 11, and there were thousands of tons of ore in sight which would not pay to return at the low prices then paid for copper, but which would now be very valuable. The adoption of Hancock's new process of dressing would result in a vast saving to the company, as they would get a higher percentage of produce and at a lower price, because there would be no necessity to employ so much manual labour. That was the process in use at Moonta.

A SHAREHOLDER enquired whether the whole of the ore raised was yellow ore or sulphurets, or whether some of it was carbonate, as at present he thought some carbonate would be of great advantage to them?

The CHAIRMAN did not doubt it; it was, however, principally sulphurets that they were at present raising. They had had some good carbonates in Wheal Maria, but they were not at present working there. On the Bremer the present company had only expended about 10,000*l.*, but there had actually been expended on the working of the mine about 220,000*l.* or 230,000*l.*; that was by the old company. This Bremer Company held about 1500 or 1600 acres of land, for which they were obtaining some rental; he would think about 300*l.* per annum, but he did not know the precise amount, as the rentals varied.

Mr. BEDFORD remarked that the shareholders would understand that although the mine did not pay dividends on the large capital of the old company, and with copper at 70*l.* per ton, they would be able to pay well on their small capital and with copper at 90*l.* At present they were getting copper out of the 63 fm. level, but it was from the deeper levels that they would obtain their chief supply.

The CHAIRMAN said they would find much copper between the 83 and the 103 fm. levels, which would well pay to take away at 90*l.*

A SHAREHOLDER asked whether the expenses of smelting would not be higher?

The CHAIRMAN thought that the expenses of smelting would be rather more, but not much more. The wood became more and more scarce every year, and the price of labour was higher, though he did not know whether that would be only temporary. But against this there was much less difficulty now in getting coal at Adelaide, and the English and Australian Copper Company used coal largely and successfully. The price of Newcastle (New South Wales) coal, laid down at Adelaide, was 27s. to 28s. per ton, and at that price of course no English could compete with it. If the price of copper kept at 90*l.* there was no doubt that they could make 18*l.* or 19*l.* per ton profit, and they used to make in the old Worthing Company's time about 28 or 30 tons per month.

A unanimous vote of thanks to the Chairman was then passed, and the meeting separated.

NORTH HENDRE LEAD MINING COMPANY.

The second ordinary general meeting of shareholders was held at the company's office, Westminster-buildings, Chester, on Friday, Nov. 15, Mr. HENRY R. BOWERS in the chair.

Mr. J. JONES (the secretary) having read the advertisement convening the meeting, the following report of the directors was then presented:—

The get of lead ore during the year has been 160 tons, and the value thereof 2087*l.* 1s. 6d. This was chiefly the result of working in the earlier months of the year; and an interim dividend of 5 per cent. was declared and paid in June last. The subsequent workings were very much hindered by the excessive rain-fall, which impeded the get of ore, and at last necessitated the erection of pumping machinery to discharge the surface water; and as a further outlay of capital was also required for opening out the old adit level and the erection of offices and buildings at the mine, it has been necessary to make calls during the year on the holders of the 1717 allotted shares to the extent of 1*l.* per share. Your directors are pleased to report that the engine put up keeps the water down, notwithstanding the exceptionally wet season. No allotment has yet been made of the 1711 shares still held by the company, and which represents a capital of 4277*l.* 10s. in reserve, to issued at par only; but, taken as fully worth 5*l.* per share, they represent 8555*l.* of available capital. For the reasons now given, your directors have not the pleasure of proposing a dividend; but as no present difficulty or obstruction is experienced from the water, and considerable quantities of ore are being raised, they have undiminished confidence in the value of the mine; and they believe that the current year will be a very profitable one to the shareholders. The "Lady Mary" new shaft has been sunk 104 yards, and a connection opened to the adit level and the old shaft, thereby admitting ventilation and effecting economy in raising the ore. Your directors have engaged the services of Mr. John Lean as resident captain, in whose ability they have every confidence, and it is believed that his efficient local management will aid in the profitable working of the mine. The directors who retire, as provided by the Articles of Association, are Messrs. Henry Richard Bowers, Urias Bromley, and William Rowland, who being eligible, offer themselves for re-election. A proposal has eminated from the Rhosesmoor Lead Mining Company that the several mines in the neighbourhood should join them in buying the powerful engines and pumps of the Great Hendre Mine. A committee, representing several contiguous mines, was formed to consider this question, and the result has been that it is considered desirable for the Rhosesmor Company to augment their capital, to enable them to take over the plant and sett of the Great Hendre Company, and to work their pumps. The most experienced mining engineers report that this would relieve the district of what is known as the dead water. Your directors have no present apprehension of obstruction from this dead water; but in the prospect of deeper workings in the future, it has been deemed prudent to assent to the scheme and to consent to subscribe 5000*l.* of the new capital which will be required if the design is carried out, and to contribute with the other mines of the district a fair proportion of the expenses of working the Great Hendre pumps. Your directors are not insensible to the difficulties which beset the practical working out of the scheme, and the claims of the several interests concerned. Your directors believe that the union of the Rhosesmor and Great Hendre Mines, as proposed, would be productive of large profits to the shareholders, quite independent of any ultimate unwatering of the district; and, therefore, it is intended to submit to the general meeting a resolution to sanction a subscription of 5000*l.* towards the new capital of the "United Rhosesmor and Great Hendre Mines," and that your directors be empowered to issue the 1711 unallotted shares, or any part thereof, in such manner as may seem best to them to raise the said portion of new capital.

The following reports of the company's surveyor and manager were also presented:—

From Llangollen, Nov. 8.—Agreeably to your request, I made a careful examination of the whole of the workings in your mine on the 1st inst. I need not, I think, go into the water difficulties you have had to contend with for the last 12 months, owing to the adit level having partially fallen in and backed the water into the workings, and thus stopped the getting of ore and the usual monthly samplings. As the adit is now being thoroughly repaired there is no probability of a similar occurrence again happening. The new shaft is down 104 yards from surface, and a communication made from it to the old workings and shaft: in fact, we went down the new shaft and came up the old one. The ventilation through the mine is now perfect, and all the ore and refuse will be taken up the new shaft at less than a tithe of what the same work formerly cost. The new shaft cut the flat about 20 yards to the north of the former workings. In the western side of the shaft the bed is thrown nearly perpendicular, and in this part the ore is fully 2 ft. wide, solid. As the flat dips very fast here to the east, this end of the shaft had hardly reached the top of the flat when we were down; but from the highly mineralised character of the ground in this part, being full of strings of ore, spar, and clay, I have no doubt but that it will prove richer and stronger in the east end than it is in the west end of the shaft. The fact of the lead being found so strong in the bottom of the new shaft so far to the north of the run of ore met with in the old workings to the west is, in my opinion, conclusive evidence that it extends over a large area, and that the further it is proved in an easterly direction with the dip of the limestone beds the stronger and richer it will prove, as it has shown a decided improvement in that direction from the point where the ore was first discovered. I believe that hitherto you have only met with the thin end of the great body of ore in your ground. I can fancy no limits to this powerful flat unless it runs into and is cut off by the east and west veins, which are known to be in your ground, both on the north and south side of the new shaft. At this junction it will be an unprecedented case if large bodies of ore be not met with. I consider the mine looking better than it ever did before, as the ore is extending in every direction. As soon as your shaft is deep enough I would recommend levels being driven, so as to prove your ground and increase your reserves of ore, and not to be in too great hurry to make samplings until this be done. Your agent and I entered fully into these matters, and he will embody the purport of our conversation in his report to you.—WALTER EDEY, Mineral Surveyor.

North Hendre, Nov. 4.—In presenting you with my report for the annual meeting, I beg to give particulars of the principal work accomplished at surface and underground since the end of last July.—Surface Erections: The bed for the engine has been made, and the engine fixed with the necessary pumping gear; the foundations taken out for T and balance-bobs, and loadings strongly built up. The office, smiths' shop, and carpenters' shop, ore-bin, store-room, and miners' changing-house will be completed this week, with the exception of slating, which is being proceeded with.—Underground—Engine-Shaft (Lady Mary): The pitwork is fixed, consisting of ore plunger-lift, 8½ in. diameter, 50 yards long, and 54 yards of drawing-lift, which I intend changing to a plunger-lift after sinking a few yards deeper. The shaft has also been enlarged in places to make room for the pumps and winding-gear, cased and divided, and permanent footway made the whole depth. All this work was completed, and the engine started on Sept. 7. I am pleased to say that the engine and pumps work satisfactorily, and answer our present requirements. Since the starting of the engine the shaft has been sunk 4 yards, and an excellent bunch of ore has been discovered, from which several tons have been raised. The lode at the west end of the shaft is 1 ft. 6 in. wide, solid ore. The east end and bottom consists of limestone and spar, strongly impregnated with lead. In consequence of the foulness of the air in the shaft I cross-cut south 21 yards to the old level, and this has given good ventilation, and afforded great facility for bringing the stuff through instead of taking it to the old shaft. The adit level has been cleared and secured 50 yards from the entrance. During the late heavy floods we had great difficulties to contend with, the ground at the sides and roof being very much crushed. I am glad to say we are getting through it, and hope soon to reach the rock. The discovery of lead in the new shaft (which is 21 yards north of the level, where we now get our returns) proves the lead-bearing ground to be of great width, and may be considered a new feature to the mine of much value. For further development of the mine, I purpose to urge on the sinking of the shaft, expecting to meet with good runs of ore as we go down; to drive

the main level east, and open on the lead as discoveries are made, also to cross-cut north and south to prove the parallel lodes, and when fully laid open I have no hesitation in saying we shall have a mine second to none in the Principality.—JOHN LEAN, Manager.

The CHAIRMAN, in moving the adoption of the reports and accounts remarked that, although the directors had not the pleasure of proposing a dividend, their property was improving in value every month. When the interim dividend of 5 per cent. was paid, in June last, it was fully expected that others would be paid before now, but the season had been so unprecedently wet, and as there was no machinery whatever to pump the water, of course there could not be any returns of ore. The board purchased an engine, which is now at work, and takes away very easily all the water, and now they did not expect any further delay in making regular monthly sales. Thirty tons of ore was sold yesterday, at an average of 15*l.* 8s. 3d., on the mine free of all expenses—in fact, the highest price of the district. A great effort has been made during the past year in placing the mine in the very best condition. The adit level has been cleared and secured for a long distance. The offices, smiths' shop, ore bin, store rooms, &c., have been erected and are very nearly complete, but the most important point, and one that the shareholders may congratulate themselves upon, is that a connection has been made between the new shaft—now 105 yards deep—and the level, and a most valuable discovery of lead made. The ventilation now is perfect, and as Mr. Eddy reports—"the mine looks better than it ever did before, the ore extending in every direction," the directors confidently expect that this year will be a very satisfactory one to the shareholders. The full reports already sent to every shareholder leave very little indeed to say, but he would just draw their attention to the resolution which would be submitted to the meeting respecting subscribing 5000*l.* to the "United Rhoses-mor and Great Hendre Mines." To this question the directors have given a great deal of attention, and they believe that the investment, apart from many other considerations, will prove remunerative. It is not expected that more than half the money will be required during the ensuing twelve months, and as the shareholders are aware at present there are 1711 shares unallotted. The board will study closely the interest of the company in dealing with the question, and he hoped the resolution would be unanimously passed. He ought, perhaps, in justice to the shareholders, to explain that the item of 958*l.* 10s. in arrears for calls in the balance sheet, was only just due when the accounts were made up, and that the whole amount had since been paid. The directors have decided that Capt. Lean, their manager, shall send a fortnightly report to the *Mining Journal*, which, no doubt, will be very satisfactory to the shareholders. He had very great pleasure in formally moving the adoption of the report and accounts.—They were taken as read, and unanimously adopted.

Messrs. Henry R. Bowers, Urbis Bromley, and William Rowland, the retiring directors, were unanimously re-elected.

It was moved by Mr. BROMLEY, in an able speech, and seconded by Mr. SIMPSON, that—"The directors be, and they are hereby, empowered to subscribe 5000*l.* to the new capital of the Rhosesmor Mining Company (Limited), and that the said sum be raised by the issue of the unallotted shares of this company, in such way as the directors shall deem best in the interests of the shareholders."

A SHAREHOLDER wished to know if any of the North Hendre directors were interested as shareholders in the Rhosesmor Mine?

The CHAIRMAN: No, not one of us. We support the movement purely on its merits.——The resolution was then put to the meeting, and carried unanimously.

The following resolutions were also passed:—"That Mr. John Caldecott be appointed auditor, at a fee of 3*l.* 3s. for each audit."——"That the best thanks of the meeting be presented to the directors and secretary for the care and attention they had bestowed on the business of the company, and that the directors be desired to take payment of their travelling expenses during the past year."

A cordial vote of thanks to the Chairman for his conduct in the chair and general attention to the interests of the company concluded the business of the meeting.

NORTH HENDRE LEAD MINING COMPANY.

A new shaft having been sunk, and a communication effected with the old workings, the directors of the company determined to celebrate the occasion by giving all their workmen a dinner at the Antelope Inn, Rhydymwyn, near Mold, which took place on Saturday. About 50 men and boys sat down to an excellent dinner provided by Mr. and Mrs. Lloyd, and the directors present were Messrs. H. R. Bowers, Urias Bromley, Wm. Rowlands, W. B. Fox, and John Lloyd.

Mr. Bowers, Chairman of the board, presided, who in proposing the usual loyal toasts stated he was much pleased to have an opportunity of meeting the men in this manner, and he could say that the directors were satisfied the work at the mine had been carried out with much energy and diligence, and that they were, therefore, glad to testify their appreciation by giving them this dinner. The health of the Queen and Royal Family was then received with acclamation.

Mr. ROWLANDS, in proposing "Success to the North Hendre Mine," said he was very much pleased to meet the men, because he believed that these kind of meetings did a great deal of good, by bringing masters and men together. The directors were most anxious to promote the well-being and comfort of their servants in every way. The mine, as they were aware, was progressing most satisfactorily; and although it would be some time yet before it was properly opened out, still they believed it would eventually be very successful. This would, no doubt, be a cause of satisfaction to the men as well as to the shareholders, because they would all partake in the pecuniary benefits. He was glad to say that the relations between employers and employed had been perfectly satisfactory, and that there had been no strikes or any unpleasantness. Mr. Rowlands concluded by proposing the toast, which was drunk with three times three.

MEREDITH WILLIAMS (one of the workmen) then proposed the health of the directors, which was responded to by Mr. BROMLEY, who, after thanking the company for the warm manner in which they had received the toast, stated that he could not add very much to what Mr. Rowlands had said, who generally managed to reap all the corn, leaving very little to the gleaners. He was quite sure the directors wished to promote the happiness and comfort of all the men, and although they never had a strike, still he did not object to strikes if that were the only way of settling disputes; at the same time he thought the best way to remedy any misunderstandings would be to use common sense and reasoning, and settle everything quietly and comfortably. Mr. Bromley then gave the men some further good advice, and concluded by saying that he compared the North Hendre Mine to a beehive, everyone doing their duty and all partaking of the honey.

Mr. JOHN LLOYD then proposed the health of the "strangers" present—Capt. Harper, Mr. Moses Evans, and Mr. John Pritchard.——Capt. HARPER, in responding, said it was a great pleasure to him to be present, and thought it was a very gratifying thing to see masters and men meeting together in this way, because it conduced to that good feeling which should always exist between them. He hoped the North Hendre Mine would increase in prosperity and success, and that many surrounding mines would turn out as prosperous as this one.

The CHAIRMAN reciprocated the sentiments of Capt. Harper, and wished every success to neighbouring mines. He would take this opportunity of stating that arrangements were in progress by which he hoped that the powerful pumping-engines of the Great Hendre Mine would again be set to work. He then proposed the health of Capt. Lean, the new manager at the mine, whom, although a comparative stranger to them, would he was quite sure do his duty to the men in every way.

Capt. LEAN, in thanking the meeting, said he thought the Chairman had overstated his qualities, but he was determined to do his duty between masters and men, and that each man should have a "fair day's wages for a fair day's work;" and as he had been a working miner himself, he knew perfectly well what men were capable of doing, and what they ought to do, and the success of mines greatly depended upon the workmen; for although much money might be expended upon an undertaking, it would not be well and profitably spent unless the men performed their work in an honest manner.

Mr. BROMLEY proposed the healths of Capt. Edward Lloyd, and Mr. John Lloyd, and the latter briefly returned thanks.

The company separated after a vote of thanks had been passed to Mr. and Mrs. Lloyd for the excellent way in which the dinner had been served.

CHIVERTON MOOR MINING COMPANY.

At a meeting of adventurers, Mr. R. MACKAY presiding, the reports of Capt. Josiah Thomas, of Dolcoath, and of the agents were read. The accounts for four months ending October showed a debit balance of 2919*l.* Capt. Josiah Thomas had inspected the mine, and reported that the engine-shaft was sunk to the 125, but the 105 was the deepest level being worked, the water being in at the bottom of the mine. All the lead ground of value had been found to the west of the engine-shaft, and nearly all that would pay for working above the 95 had been taken away. Chiverton Valley flat-rod shaft, which was sunk to the 95, was only about 25 fms. before the 95 fm. level end, and 35 fms. before the 105; and as the productive ground was already at such a great distance from the engine-shaft, and still dipping west, the best plan he considered for working the lode to a deeper level would be to sink the flat rod shaft below the 95. That could be done by the aid of flat rods attached to the present engine at no very great expense, most of the requisite materials being already on the mine. With respect to this, he observed that although the lode in the most productive parts was by no means rich, yet at the 105 it still retained its usual size and value, and had a sufficiently promising appearance to warrant its prosecution at a deeper level. If a large extent of such quality ground as was then being stoped could be laid open for working at the same time, the mine would be brought into a profitable state; but unless the productive ground lengthened, or the lode improved in quality, he did not see how that was to be done.——A call of 10s. per share was made.

ST. IVES CONSOLS MINING COMPANY,

The quarterly meeting was held on Tuesday. The purser, Mr. P. H. APLIN, presided. The statement of accounts set forth that the labour cost for the three months had been 2528*l.*; coals, 509*l.*; stamps, rent, &c., 148*l.*; carriage, 48*l.*; merchants' bills, 466*l.*; total expenditure, 3691*l.* The credit side showed that the tin sold (14 tons 15 cwts.) realised 3157*l.*, and 8 tons ready for sale were credited at 640*l.*, the actual profit on the quarter's working being 106*l.* The balance of 1681*l.* against adventurers at the last account was now reduced to 1253*l.*, owing to 322*l.* worth of dues having been remitted by the lords. In the course of the agents' report it was stated that in the Ransom lode the 107 was being driven east of the slide, and was producing good stones of tin, but not sufficient to value. The 107 had been driven during the past quarter through 4 fms. of good tin ground, worth 35*l.* per fm., but for some time past the lode had been disordered by the slide, and was at present unproductive. The lode in the 87, east of the slide, was producing some good grey copper ore and occasional stones of tin, and they were driving three cross-cuts south to intersect that lode at other levels, in which they expected to cut the lode in about six months. In the great carbona lode they were rising in the back of the 70, on a lode 1½ ft. wide, worth 5*l.* per fm. The agents could not say what distance further they would have to rise to get over the whole workings, but they were keeping very near, and holed to them occasionally to ascertain their position. In the 137 the lode was producing a little copper and tin, and the agents expected the level to improve, as it would soon be over the run of tin ground that proved very productive in the back of the 147. Since the last meeting the prospects of the mine had improved a little, as it had returned for the three months 45 tons of black tin; and, judging from the general appearance of the mine, the agents hoped to be able to sell quite as much tin in the coming quarter—153 men were employed underground, 52 of whom were on tribute at 9s. 6d. in 1*l.*——The CHAIRMAN stated that he did not consider it necessary to make a call at that meeting.——Mr. MICHELL then proposed, and Mr. J. GOODMAN seconded, the passing of the accounts, which was carried, and the business was concluded.

SOUTH CROFTY MINING COMPANY.

The quarterly meeting was held at the mine on Monday, when there was a numerous attendance. Mr. E. H. RODD, the purser, read his report, which set forth that the balance against the mine was 3040*l.*, and at the last account it was 4029*l.* A call of 2*l.* per share was then made, and since that meeting he had received and credited the amount of the compensation awarded for the encroachment on the part of East Pool. The amount of call, less discount, and the compensation together, had amounted to 3751*l.*, which, deducted from the balance, left a debit against the adventurers of 277*l.*, and that, added to the present adverse balance, made a deficit of 3040*l.* to be provided for. They had heard from the agents' report how they stood with regard to the erection of the new stamps, and these being at length at work the large amount of tinstuff at the surface and underground, which might be estimated to be worth 3000*l.*, would be forthwith stamped and the produce sold. He, therefore, thought the present adverse balance would be pretty well, if not entirely, covered; and after conferring with several large and influential adventurers on the subject, he was not disposed to press for a call at that meeting, although he thought financially it would be right to do so. He was happy to inform the adventurers, upon the authority of the manager and the other agents, that a considerable amount of the new machinery was completed, and to their satisfaction, and that the new stamps were steadily at work. The costs for the next three months would be very considerably reduced, but there would still be heavy charges to be met before the new works were perfected. The present adverse balance would have been considerably less had not the standard of copper sustained so heavy a fall. This had caused a loss of at least 1000*l.* The price of coal was now 25s. a ton, that being double the price of coal at this time last year.

Capt. Jos. THOMAS thought they should make a call. It was true they had a large quantity of tinstuff at the surface, but it was not money.——Mr. HOLMAN suggested that a 30s. call should be made, and that the balance should be allowed to stand over; but he disagreed with the proposition to allow the entire debt to stand over.——Capt. J. THOMAS stated that the whole of the mine had been renovated from top to bottom, and a large sum of money laid out, while the whole of the calls made only really amounted to 3*l.*——A call of 30s. per share was made.

The CHAIRMAN stated that at the last meeting it was decided that a committee should be formed for the purpose of making a suggestion to the lords for the sanction of a reduction in the dues. The matter had been before the committee, and they had spoken to the agents of the respective lords on the subject; but he was sorry to inform the meeting that the proposition had not been, and would not be, entertained by the lords.——Mr. T. T. WHEAR: Are the lords unanimous in that decision?——The CHAIRMAN: Sir Richard Vivian has emphatically refused, and, therefore, the other lords have agreed to adopt the same course.

Capt. THOMAS considered it unfair that their mine should have to pay 1-15th and 1-18th dues, while the best dividend-paying mines in the neighbourhood were only paying 1-20th.

[For remainder of Meetings see to-day's Journal.]

THE VAN MINING COMPANY—MONTHLY REPORT.

Nov. 20.—Seaham's shaft is set to 10 men, to sink below the 60, 3 fms. stent, at 23*l.* per fathom. The 60 fm. cross-cut north has been extended 6 fms. from shaft; set to six men for the next two months, at 150s. per fathom; the lode has been cut to the full width, and well timbered, allowing ample room for tramways, &c., to the cage. In the 45 west the cross-cut at the present end of this level, 72 fms. west of shaft, is now driven 4 fms. 3 ft., of which the last 16 ft. has been driven through a lode worth on an average 70*l.* per cubic fathom; set to six men, at 300s. per fathom. The same level upon the footfall of the lode has been driven 6 fms. 2 ft. west of the 54 fm. level cross-cut, and is now 60 fms. 2 ft. west of engine-shaft. The lode in the present end is worth for lead ore 60*l.* per cubic fathom; set to six men, at 200s. per fathom. The stripping down of the lode to full width in the side of the last-mentioned level, at a point 50 fms. west of shaft, is set to six men, at 120s. per fathom. The lode here is worth on an average 50*l.* per cubic fathom. The 44 fm. stope, in back of the 45, west of shaft, is set to six men, at 120s. per fathom. The 37 fm. stope is set to eight men, at 85s. per fathom. The 30 fm. stope is set to eight men, at 80s. per fathom. The 24 fm. stope is set to four men, at 85s. per fathom. The 16 fm. stope is set to six men, at 80s. per fathom. The 8 fm. stope is set to eight men, at 80s. per fathom. The 8 fm. stope, east of shaft, in the back of the same level, is set to eight men, at 80s. per fathom. The 16 fm. stope is set to six men, at 80s. per fathom. These stopes will average in width 17½ ft., and produce 37*l.* per cubic fathom. The 45 in the soft, by the side of the lode, is now extended east of shaft 48 fathoms; set to four men, at 70s. per fathom. We intend in a few days hence to put this pare of men to cross north to prove the value of the lode at this forebreast. The level upon the footwall of the lode, westwards from the 30 cross-cut, in the side of this level, is set to six men to drive, at 280s. per fathom; the lode here is worth 36*l.* per cubic fathom for lead ore. The 30, west of shaft, is now extended 62 fms.; set to four men, to drive in the soft by the side of the lode, at 70s. per fathom. We have also set to the same pare of men to cross north at the present end to prove the value of the lode, at 100s. per fathom. The winze sinking below this level, at a point 48 fms. east of shaft, is communicated to the 45; this section of the mine is now well ventilated; set to six men, to drive a permanent or tye level parallel with the 30, east of shaft, in the country rock, at 105s. per fathom. The 24 fm. stope, in the back of the 30, east of shaft, is set to six men, at 100s. per fathom. The 16 fm. stope is set to six men, at 80s. per fathom. The 8 fm. stope is set to six men, at 70s. per fathom. These stopes are worth on an average 25*l.* per cubic fathom: mean width, 24 ft. The 8 fm. stope, west of shaft, in the back of the same level, is set to six men, at 80s. per cubic fathom. The 16 and 24 fm. stopes are suspended for the time. The 30 fm. stope is set to six men, at 75s. per fathom. The 35 fm. stope is set to six men, at 80s. per fathom. The 40 fm. stope is set to eight men, at 80s. per fathom. The 44 fm. stope is suspended. The 48 fm. stope is set to six men, at 90s. per fm. The 54 fm. stope is set to six men, at 90s. per fathom. The 61 fm. stope is set to eight men, at 85s. per fathom. The 70 fm. stope is set to eight men, at 85s. per fathom. The 78 fm. stope is set to eight men, at 90s. per fathom. The lode is on an average 18 ft. wide in these stopes, and worth for lead ore 32*l.* per cubic fathom. The 15 fm. permanent level, west of shaft, is set to six men, at 140s. per fathom. The 15, east of shaft, in the soft by the side of the lode, is set to four men, at 80s. per fathom. The 24 fm. stope, in the back of the 15 east, is set to eight men, at 75s. per cubic fathom. The 16 fm. stope is set to six men, at 70s. per fathom. The 8 fm. stope is set to six men, at 80s. per fathom. These three stopes are worth on an average 14*l.* per cubic fathom; width, 19 ft. The 54 fm. stope, in the back of the same level, west of shaft, is set to four men, at 80s. per fathom; the lode here is worth 14*l.* per fathom; mean width, 25 ft. The adit level, east of shaft, is set to two men, at 130s. per fathom, to cross-cut south at the present end. The rise from the 204, west of shaft, in the 45, is set to four men, at 75s. per fathom. Set to twelve men, to deliver all the orestuff in trams into the cage at Seaham's shaft from the different levels and passes throughout the mine, at 5s. 4d. per score tramloads.—Surface: The machinery is all in good order. Our sale takes place tomorrow upon 480 tons of lead and 150 tons of blende.—WM. WILLIAMS.

GREAT NORTH LAXEY.

In connection with mining enterprise it is by no means exceptional to find that the estimate as to the length of time necessary to bring a property into a dividend-paying condition has been underestimated by those originally undertaking its development; yet, if the mine be situated in a good district, the instances are very rare in which continued energy fails to be rewarded by dividends, which amply compensate for previous disappointment. Indeed, so extensively is this fact recognised, that many of our most successful miners—men who have commenced with but little and died worth thousands—have adopted it as an invariable principle that a young mine is always better worth buying after a company has lost all its capital upon it and abandoned it. Great North Laxey is at present precisely in that position which men of the class just mentioned would consider justified them in making the purchase of it; and hence it is easy to understand the necessity for the directors in their report, presented at the extraordinary meeting on Wednesday, to remind the shareholders that "the mine will not under any circumstances be abandoned, and that there are parties who are confident in its ultimate success who are ready to carry it on," since it gives the existing shareholders an opportunity of preventing the benefits of their enterprise and outlay being gained by others.

But it was sufficiently evident from the directors' report that the company is in a financial difficulty—the mine is 750*l.* in debt, a cost-sheet must be paid in the course of a week, and the available assets are only sufficient, after payment of creditors, to make a small return to the preference shareholders and leave nothing whatever for the ordinary shareholders. The shareholders as a body appear to have, and certainly seem justified in having, confidence in the ultimate success of the concern, but all are naturally averse to provide funds for the advantage of any shareholders who will not co-operate with them. Preference shares and similar modes of raising the required funds have the insuperable objection that those unwilling to contribute remain a burden to the company, and at the same time throw a heavier burden on those of their co-shareholders who provide the funds; it, therefore, becomes necessary to adopt some means of enforcing equal contributions from all.

At present the shareholders have a property of great prospective value; but, inasmuch as no returns can be obtained from it without additional outlay, the ordinary shares are of no intrinsic value, and the preference shares merely worth the small dividend which the assets are estimated to yield, so that the proposition made at the meeting to voluntarily wind-up and sell the entire mine as a going concern to a new company (presumably consisting of the present shareholders) really throws no injustice upon those who decline to take their proportion of the new shares, although it is proposed to give the whole of the shares created as vendors' shares by way of bonus to the subscribers of the new capital. Those who decline to subscribe will merely be in the same position, pecuniarily, as at present. They will have no shares, it is true; but, since the shares they have are, under existing circumstances, absolutely worthless, they lose nothing. Those who subscribe secure their fair proportion of the property (and in the case referred to as precedent nearly every shareholder took the full number of shares he was entitled to), and since the bonus shares are all retained amongst themselves the loading of the capital is only nominal, and no one is prejudiced. If the capital produce the desired result, as it is confidently anticipated it will, the bonus shares acquire a real value, and thus an additional advantage is derived, while even at once they practically represent two-thirds of the amount subscribed. The proposition seems in every way worthy of adoption, and will, it may be hoped, suffice to accomplish the object in view.

COLLIERY ENTERPRISE IN SHROPSHIRE.

Local advantages and the proximity of a good market has frequently much more to do with the realisation of profits than circumstances which, without carefully considering details, appear exceptionally favourable; and from the report of Mr. Joshua Richardson, M. Inst. C.E., F.G.S., this opinion would appear to be particularly applicable to the Clee Hill coal fields, referring to which he remarks that although they are only about five square miles in area, and, therefore, almost insignificant when compared with extensive coal fields in South Wales and the North of England, yet they are so rich in minerals of good marketable qualities, and so well situated for an extensive trade, that it is surprising that they have not earlier attracted the attention of capitalists, and that their great resources have not been developed on a more extensive scale than has yet been attempted. The cause of this surprise is now to be removed, the CLEE HILL COLLIERY COMPANY, with a capital of 40,000*l.*, in shares of 1*l.* each, having just been incorporated, with limited liability, to purchase for 30,000*l.* (of which amount the sum of 12,000*l.* is to be paid in cash, and the remaining 18,000*l.* in fully-paid shares) an extensive mineral property, having an area of over 2900 acres, and embracing nearly the whole of the high portion of the Clee Hills. The property is estimated to contain about 11,000,000 tons of coal unworked, and lying in a position especially favourable for profitable working. The whole of the coal seams, with the exception of the two lower, are drained by an adit level, so that there will be no necessity for pumping machinery, and the coal when broken will merely have to be brought to bank.

With regard to the work already done, it is mentioned that the late owners, Messrs. Pearson, did not give the property their personal supervision, being engaged at their other collieries, yet the coal and other minerals have been yielding a profit sufficient to pay a dividend of 12½ to 15 per cent. on the purchase-money, but it is estimated that with thoroughly efficient management and a judicious outlay of capital this profit can be increased to 23,000*l.* per annum, or upwards of 30 per cent. on the entire capital of the company, and this calculation is based upon a profit of only 2s. 6d. per ton for coal, which is less than was being made before the rise in prices took place. The report of Mr. John Brunton, M.Inst.C.E., F.G.S., &c., is very elaborate and favourable; he estimates that 23,875*l.* may be annually realised, but to produce this result capital will be required for sinking three or four pits, the purchase of improved machinery, both winding and pumping, the erection of screens, and weighing apparatus at each pit bank, tramways to communicate with the main line of railway, colliers' cottages, coke ovens, brick-kilns, and machinery, lime kilns, &c. He considers the terms mentioned for the acquisition of the estates extremely reasonable; but, while advising them to close with the offer, adds that the whole of the present system of management and organisation must be radically changed. The directors point out that the property is in full work, and allowing matters to go on pretty much as they have done hitherto, and with no better supervision or management will give a certain dividend of (say) 10 per cent, on the entire capital, and at the present rate of working it would take two or three centuries to exhaust the coal estimated to exist, whilst under first-rate supervision and good management, and with a judicious outlay of the company's working capital, there is an equal prospect of the very high dividends already alluded to.

DEATH OF THE INVENTOR OF THE ELECTROTYPE PROCESS.—Mr. C. J. JORDAN, the Inventor of Electro Metallurgy, died on Oct. 5, and was buried on the 13th at Finchley Cemetery. He was from early life a journeyman printer, being last engaged in a large establishment in Red Lion court, Fleet-street. Never, sure, was a man ever possessed with a more unambitious mind, or more uniformly simple habits; but under happier auspices his genius would most certainly have shown itself to the advantage as well of science as of society. His fate has been the usual fate of worthy but unaspiring talent; his name is almost unknown, and he leaves behind him, without the least provision for their support, a wife and three children, while the rent of the house he occupied for 30 years is being raised, and arrears of rent anxiously demanded. The tardy award of public justice to a worthy living character is strikingly illustrated in the fate of the originator of the beautiful art of electrotype, which should earlier have taken the name of Jordantype, from its discoverer—but a strange history, a tangled yarn, was our knowledge hitherto about the origin and early progress of this wondrous gift of chemical science to the ornamental arts, the art, as it may be called, of casting in metals under water. The earliest published account of the electrotypic process occurs in the *Mechanics' Magazine*, in a letter from Mr. Jordan, dated May 22, 1839, under the title of "Engraving by Galvanism." He therein alludes to a vague report then current in the public prints to the effect that Professor Jacobi, of St. Petersburg, was making a similar application of voltaic electricity, of which the *modus operandi* was unknown. He observes that his own experiments, dating back early in the summer of 1838, had been completely successful, and takes that opportunity of unreservedly disclosing every detail. He describes his apparatus, points out the cautions requisite to produce tenacious metallic deposits, and recommends heat and other means for separating them; mentions casts for dies, casts from non-metallic substances, the making of tubes of vessels, and other articles with which manufacturing operations in this particular branch during the 13 years have made us all familiar, as well as by the numerous splendid specimens exhibited at the Crystal Palace. Mr. Jordan, the parent of all this, remained poor, neglected, unknown. So much for genius and the pursuit of knowledge under difficulties. The designation of Jordantype has been proposed as a crowning honour to the inventor from the public; it is just that kind of gift they have it in their power to bestow, and the time may arrive when a few of the wealthy bodies of men, enriched by Jordantype, will raise a living monument to their glory and his renown, not allowing the inventor as of old to die—to figure in bronze. The greater part of the neglect Mr. Jordan has received is attributable most likely to the shade of doubt cast on his claims by a Mr. Thos. Spencer, of Liverpool, who, on Sept. 12, 1839, read a paper on the same subject before the Polytechnic Society of that town. Between May 22 and Sept. 12 there is a difference of four months. It seems, however, he persisted in asserting he possessed documents to prove priority, but carefully eschewed making them public, until the occasion of a dinner given to him by his private friends, in a public manner, and reported in the papers, in December last, previous to his leaving Liverpool. To the astonishment of every one his earliest and most important document proved to be only a notice sent to the secretary of the Liverpool Polytechnic Society, where it was read May 9, 1839 (see our number for Jan. 24), which notice was no more than a counterpart of the vague paragraph that was making the round of the papers respecting Prof. Jacobi's reputed discovery. A more contemptible evasion can scarcely be conceived than to attempt to make an unmeaning, vague, empty notice, dated May 9, take precedence of a "Communication"—a full detailed account of a process, reserving nothing, making no secret of any part, and dated May 22—is so monstrously absurd as to be unworthy any further criticism or comment. Dr. Ure, in the addenda to his "Dictionary of Arts," &c., has paid a just tribute of respect to Mr. Jordan; and other distinguished writers have accorded him a like honour. Our present remarks are drawn from a pamphlet issued by Mr. Dircks, entitled "Jordantype, otherwise called Electrotype; its Early History, being a Vindication of Electro-Metallurgy," in which he reprints his papers from the *Mechanics' Magazine* of 1844; adds other notices, and concludes with strictures on Mr. Spencer's long written speech of December last, pointing out his neglect of those facts and dates he here pretends to supply, while he withholds the reading of the "notice" on which *his* claim was based, preferring to give a luminous exposition of his own, not of what he did write May 9, 1839, but of what would have been much more to his advantage had it been any other than a mere fancy sketch. We willingly lend our aid to give circulation to those few facts which, at some future day, may draw more regard than they will probably at present excite. Our main desire being to foster genius wherever it is found, and while boasting our national enlightenment, not ourselves to commit the egregious error of tamely permitting talent to pass totally unacknowledged and unrewarded.

MALLEABLE IRON AND STEEL.—Mr. J. ANDERSON, of Newbuildings, Londonderry, has patented some improvements in refining iron, in obtaining malleable iron and steel, and in the apparatus. The refining is effected by introducing into a furnace hematite, or other ore or oxide of iron sufficiently pure to withstand a high temperature without fusing. The oxide is heated without being reduced by passing through it an oxidising flame or a hot current of completely burned gases or gaseous products of combustion. The iron percolates down through and over the surface of the heated oxide. The impurities from both iron and oxide will combine with a portion of the oxide to form a slag or cinder, which will be lighter than the iron, which will, therefore, leave the slag and reach the bottom of the furnace in a more or less purified state. If it is wished to purify the iron further, it is next run through a similar furnace, containing heated coke or charcoal. It may then be run a second time through the oxide furnace, and the alternate running through columns of oxide and of carbon may be repeated until the iron is sufficiently pure. In order to remove the cinder or slag from the iron without diminishing its fluidity, the iron may be run through a furnace containing heated silica, alumina, lime, magnesia, or other suitable substance, which without diminishing the quantity of carbon in the iron will attract the cinder or slag from it.

FOREIGN MINING AND METALLURGY.

Copper has been pretty well maintained upon the Paris market. Chilian in bars has made 89*l.*; ditto in ingots, 93*l.*; tough English, 93*l.*; and Corocoro minerals (pure copper), 90*l.* per ton. There has been comparatively little business passing in Chilian copper at Havre, and for a very good reason—there is scarcely any stock. At Marseilles there has been comparatively little doing in copper, as consumers are restricting their orders more and more. Upon the whole, prices have experienced little change in Germany, but the state of affairs remains uncertain. Tin has experienced no change at Paris; prices may be said to have been pretty well maintained. At Marseilles the article has exhibited a little more firmness, but the demand has not become much more active. Banca is quoted at 164*l.*; English at 162*l.*; and Straits at 160*l.* per ton. At Rotterdam tin has been feeble, the advance in the rate of discount having contributed to its weakness. Banca has been quoted at 91 fls., and Billiton at 86¼ fls. The German markets have not exhibited much change. At Cologne, however, transactions have been limited. At Hamburg the article has found purchasers at full rates. At Paris, Spanish and English lead has risen 4s. per ton; while French, Belgian, and German has advanced 8s. per ton. Spanish lead is quoted at Paris at 22*l.*; Spanish and English make 21*l.* 12s. per ton at Havre; and Belgian and German have realised 22*l.* per ton. The article has also exhibited more firmness at Marseilles, at the same time, transactions have been limited. Lead has been maintained tolerably firm upon the German markets. At Berlin, however, transactions have presented no great importance. Good marks of tin have risen 4s. per ton at Paris. Marseilles has remained without change. The Vieille Montagne Zinc Company has advanced the price of its rolled zinc 2*l.* per ton. German zinc markets have been firm.

The feverish activity which has prevailed in the French Iron Trade has been succeeded by a period of comparative quiet. There are now no more rumours as to further advances in prices, although orders follow each other with considerable regularity. Prices remain firm, notwithstanding the fall which has taken place in English metallurgical products, which are only disposed of with difficulty at present. The Treaty of Commerce with England just concluded by France has involved no change in the tariff in force as regards pig and iron. A similar treaty with Belgium is on the point of being ratified, and, if our information is correct, the terms will probably afford mutual satisfaction. Rolled coke-made iron is quoted at 14*l.* to 14*l.* 8s. per ton; charcoal-made iron, 15*l.* to 15*l.* 4s. per ton; plates are selling at 20*l.* to 20*l.* 8s. per ton, while finished and adjusted axles realise 19*l.* 8s. to 19*l.* 12s. per ton. The production of iron is constantly increasing in France; thus the relighting is announced of the Vendeuvre blast-furnace, the Louvemont blast-furnace, and the Pancey blast-furnace. In the Franche-Comté district several new blast-furnaces are also about to be lighted, The Committee of French Forgemasters has, through its secretary, protested against the proposed monopolisation by the State of the manufacture of dynamite. The Pont l'Evêque Forges Company at its last meeting approved of the continuance of the company for a period of ten years and the purchase of the St. Etienne collieries. A contradiction is given to a statement that the French Administration of Telegraphs has attempted to purchase telegraphic wire in England. The administration certainly applied to some English houses for price-lists, but nothing more transpired. The Naval and Railway Blast-Furnaces, Forges, and Steelworks Company will pay, on the 30th inst., half its dividend for 1871-2, or 1*l.* per share.

In the Belgian coal trade the upward tendency in prices appears to have received a decided check, and not only is this the case, but no further apprehensions are now entertained as to scarcity, as the fact is now recognised that the present production is sufficient to meet the requirements of consumption. There has been no material fall in prices thus far, but a reduction in quotations is reported as inevitable. In the Charleroi basin the navigations have been interrupted by floods; it is hoped and expected, however, that traffic will shortly be resumed. Meanwhile there has been for the time an extra amount of coal traffic thrown upon the Belgian railways, and complaints are heard on several sides as to a want of trucks, especially on the Great Central Belgian system. The demand for coal continues active on all sides, and coke can scarcely be met with at all; it has risen from 2*l.* to 2*l.* 4s. per ton, and a quotation of even 2*l.* 8s. per ton is now talked of at Liége. Some German coal has arrived in Flanders, but at rates too high to occasion any apprehension on the part of Belgian coalowners. Contracts for coal for next year are being now concluded with much less ardour than formerly. Freights have scarcely varied.

The dividend of the Basin of Charleroi United Collieries Company for 1872 is 7½ per cent. The net profit realised for the year was 61,594*l.* The dividend of the Fives Lille Company for 1871-2 is 3*l.* 8s. per share, payable, however, to the extent of 1*l.* per share in a bond of liquidation. The Béthune Mines Company has been paying this month a dividend of 12s. per share.

The check which the iron trade has experienced appears to be definitively accepted in Belgium. Everyone seems to be agreed as to the probability of no further advance being established in prices, but opinions differ upon the question whether this is a favourable or unfavourable result for industrials. Meanwhile, prices are tolerably firmly maintained in Belgium. There is a good current of orders, and pig is extremely well held, at about 6*l.* per ton for bar-iron. The question of minerals is becoming more and more embarrassing for the iron trade. The minerals which are received from Spain, as well in England as in Belgium, have given rise to numerous complaints for some time past; the quality has notably fallen off, and the irregularity of the deliveries is giving rise to very great embarrassments. *Apropos* of Spain, we learn that the Spanish railway companies will in future have to pay customs upon all *materiel* imported by them; they will also have to pay back duties as from the expiration of ten years from the date of the completion of their works. Among the companies affected by this decision we may mention the Northern of Spain, the Madrid, Saragossa, and Alicante, the Cordova and Seville, and the Saragossa, Pampelimá, and Barcelona. The Ougrée Iron-works Company is about to establish a differential rolling mill on the Lauth system, which attracted a good deal of attention at the last meeting of the Iron and Steel Institute, and which has already been adopted by several English firms. We are not in a position at present to announce the results of a re-adjudication of rails for the Belgian State lines, which took place on Wednesday; it is understood, however, that the offers made by English firms were rejected.

The advance which has been taking place in the French coal trade has been definitively checked. The dearth of coal has greatly diminished, and deliveries are made with regularity and abundance, but no very decided fall can be reported at present quotations. In the South of France coal is still a good deal scarcer than in the North of the Republic. This is attributed first to the manner in which the Paris, Lyons, and Mediterranean Railway conducts its coal traffic; and, secondly, to the local exportation of coal to Italy *via* the Mont Cenis Tunnel, which is facilitated by differential tariffs. At Paris, English coal is reappearing, but only in small quantities, and for the purposes of special industries. If the fall which is taking place in prices in England should continue, it is hoped, however, that it will be possible to obtain English coal, and that, too, upon tolerably moderate terms, upon the north-western coast of France. The navigations have been affected by floods, and arrivals by boats have considerably slackened in consequence. Railways have obtained this surplus traffic, and there has been no reason to complain of the activity and energy with which the Northern of France Railway Company has conducted this branch of its business. A considerable sensation has been produced by an explosion of fire-damp at the Sante-Eugenie Pit, at the Blanzy Collieries. This explosion most unhappily resulted in the death of 38 working miners, while 6 others were bodily wounded. Sad accidents such as this lead observers to deplore the inefficiency of the precautionary measures hitherto adopted. In connection with the Franco-Belgian Treaty of Commerce, it is understood that France has consented not to increase the duties imposed on the importation of Belgian coal and iron.

COLORADO.—The Denver and Rio Grande Railway is now completed to the Canon City coal fields. The coal produced by these mines has the reputation of being far superior to any other in that territory. Col. Greenwood, the chief engineer of the Denver and Rio Grande Railway, has returned to Denver, after making a preliminary survey for the extension of the line south to El Paso, thence through the great mining plateau of Zacatecas, Durango, and Chihuahua, skirting the base of, and parallel to, the Sierra Madre range of mountains in Old Mexico, to Guanaxuato, and thence to the city of Mexico. In Gilpin county the Bobtail tunnel is being rapidly extended, and will reach the vein by the close of the year. The Bobtail is one of the best gold mines in Colorado, but work has been suspended until the completion of the tunnel, which will effect perfect drainage. Central city is now being supplied with coal by the new railway, thereby reducing the cost of fuel fully 40 per cent. At Georgetown work has been resumed on the Monticello Tunnel, Republican Mountain. This tunnel, at a distance in of 2200 ft., will cut the Snowdrift vein, which is owned here, at a depth of 2000 ft., besides several intervening veins.

THE GOLD RUN HYDRAULIC MINING COMPANY.

The following is extracted from a report recently received from Mr. Charles J. Hill, barrister at law, Lincoln's Inn, who being in California on other business, the directors availed themselves of the opportunity of obtaining from him an independent and reliable report upon their property:—

In obedience to a telegram I received from the board, directing me to examine the company's property at Gold Run, I proceeded last week to visit the locality, and have now the honour to transmit to you the result of my investigations. Mr. Kipp, your agent, accompanied me over the claims, and explained to me the improvements he has made since February last, when the company took possession, and also the course which he advises you to adopt, with a view to further increasing the returns of the mine.

Gold Run Station is situated at about 12 hours by rail from San Francisco, and the claims of the company are about 1 mile from the station, so that the means of transport of stores, and of communication both by post and telegraph, are such as few mines possess. The first claim bought by the company was what was called the Cedar, and consisted of about 25 acres; but before the purchase was completed the adjoining piece of land, called the Warren Tract, and containing about 6 or 7 acres, was required. More recently the company have obtained possession by purchase of another claim, called the Sherman, immediately next to the Cedar, and of an area of about 37 to 40 acres. The entire claims now the property of the company have an area in round figures of 75 acres.

Since Mr. Kipp has had the management of your properties, he has, in addition to many minor improvements, constructed a roadway into the Cedar claim, which will materially economise cost and labour, as everything can now be hauled straight into the claim by a team without changing; whereas formerly all articles and stores had to be taken to the top of the gravel sides and then let down by ropes from the edge of the bank, a proceeding which involved several shifts and changes. A great deal of cost and labour have been expended also in the construction of fresh sluices, and in altering the direction of the old ones, rendered necessary by new banks of gravel being operated upon. The existing tunnel will for some time be sufficient to work with efficiency the present level or bed; but as the company proceed to work the lower strata it will probably be necessary to drive a fresh tunnel, so as to carry off the debris that accumulates, and the water.

To better understand the nature of the mines known by the name of gravel claims, I may as well state that the theory is that they are the beds of an ancient river, which has been filled up either by some convulsion of nature or by continual washing down of stuff from the sides of the adjacent mountains. The gold that was brought down with the rubble, being the heaviest in weight, naturally sunk to the bottom of the semi-liquid mud. The consequence is the lower you go down and approach the bed-rock, forming the bottom of the river, the more auriferous is the soil. The top soil is ordinary gravel, containing a certain amount of gold, but richer as you go down. This bed of gravel is so thick that to work it conveniently it has been found necessary to wash it down to a certain point at a time, so as to form levels. The gold hitherto obtained by you has been extracted entirely from this description of gravel. The first level on your property has not been yet nearly washed, but workings on the second level have nevertheless been carried on where practicable. It must be understood that the first level must be washed down before the gravel immediately below it, and forming the second level, can be attacked. From the second level downwards there comes what Mr. Kipp calls blue gravel. This is of a different colour to the topmost strata, and contains still more gold; and in your property has been ascertained to be from 120 to 130 feet thick. Below this is the blue lead or cement, the richest matter of all. This goes down to the bed-rock, is in appearance like blue mud, but very hard, and requires to be crushed as quartz would. What the thickness of this valuable deposit in your claims may be is a matter of conjecture, but in the Mill claim, which is an adjoining claim to the Cedar, it is known to be from 6 to 10 feet thick. That the company possess a stratum of blue lead is almost a certainly, for not only is it, as I have said, found in the Mill claim, which is on one side of the Cedar, but it has also been struck in a shaft called the 49, sunk in a spot on the other side, and a straight line following the course of the channel, drawn from one point to the other, would necessarily pass through your property. Further to convince me that your claims are in the ancient river channel, I was shown the bed or rim rock cropping out at the surface on the east and west, which forms the sides of it.

From the fact that a great portion of gravel on the first level has not been touched as yet, and still less on the second, while the "blue gravel" and "cement" still remain unworked, it may be inferred that your property is being only now developed, that it will increase in richness, and that a number of years must elapse before the claims can be exhausted. Mr. Kipp is, however, desirous of increasing at once the returns of the company. With this view, he proposes, with your sanction, to sink a shaft at once from the second level through the "blue gravel" to the "blue lead," and drifting. A small stamp-mill would have to be erected to crush the "cement" when raised. He estimates that the cost of sinking and prospecting the full width of the channel would be probably about $1000. The shaft could be proceeded with during the winter months, and would not interfere with working the gravel by hydraulics. When the proposed scheme is carried out the gravel and "cement" would be worked simultaneously by their respective processes, and thus double returns would be made. During the two or three months of dry season in the autumn, when hydraulic working of the gravel cannot be effected, owing to the scarcity of water, it is possible that the cement might be crushed by the aid of steam-power, and water might be obtained sufficient to wash the crushed stuff when leaving the mill, though not of requisite force for other purposes. This, however, would require further consideration as to cost, &c., being merely an idea that struck me, and not a suggestion of your superintendent.

The rainy season in this country commences generally in November, and the reservoirs begin to get low in August. For some weeks, therefore, in the autumn hydraulic working ceases, and no returns can be made. Expenses, however, during this period are necessarily curtailed, as very few men are required about the mines. When I saw the property last week there were only three or four men in the company's pay, and they were employed chiefly about the new road, and getting the sluices and other things in order for the winter, so that no time might be lost when the rains commenced.

The company have no reservoirs or stores of water of their own; all the water needed for hydraulic and other purposes must be paid for. The greatest amount of water used by the company is supplied by the "South Yuba Canal Company;" some quantity was obtained this season from the "Cedar Creek Company," which is a water as well as a mining company. I ascertained, from an inspection of the superintendent's books, that the rental paid for water by your company since taking possession of the property up to the middle of September, when washing ceased, a period of about eight months, was $8400 Some idea of the quantity of water used may be formed from the fact that the nozzle of each pipe now in use is 6 in. in diameter. The force of the discharge can only be understood by those who have seen it. Although there was no washing going on at your mines, I fortunately had an opportunity of seeing its effect in a neighbouring claim, and thus am able to speak as to the apparent ease with which a bank may be washed down.

As you may be anxious to know what the returns of gold have been from the commencement, I have extracted from the books the following figures for your information:—Gold Dust Account: February, $6487·74; March, $6439·02; April, $6157·96; June, 4295·66; August, $5280·14; September 17th, $4718·72.

It must be remembered that a great deal of dead work had to be done during the summer to get the claims into proper working order: that will explain partly the reason why there was not then so much profit; and at the same time, the fact must not be lost sight of that as summer advances so the water decreases both in quantity and force, and it constantly happens that only half-a-day's washing at a time can be effected, from want of water, for some period before the water entirely falls.

I examined carefully the books of your superintendent, and found them in order, and well kept. All vouchers and receipts were produced to me, and I made almost as complete an audit as a regular auditor would do. I had not time, it is true, to go into the particulars of each bill or payment, but when I selected at hap-hazard certain items as tests, the receipts were immediately forthcoming. Mr. Kipp was away on business of the company when I arrived, and, therefore, did not know of my coming, and could not consequently have prepared his books for the occasion.

FOREIGN MINES.

ST. JOHN DEL REY.—Morro Velho, Oct. 17: Morro Velho produce for September, 502 oits., from re-grinding the refuse sand. Morro Velho cost for September, 375*l.*; loss for September, 178*l.* Gaia produce for September, 464 oits., from 394 tons of ore; yield 1·182 oits. per ton. Gaia cost for September, 337*l.*; loss for September, 135*l.* Outlay new shafts, September, 1326*l.* New shafts sinking 15 days in October—A, sunk 1 fm. 2 ft. 9 in.; B, sunk 1 fm. 4 ft. 3 in. The shafts are now passing through a small vein of lodey matter, which makes the sinking difficult until it is passed through.

DON PEDRO NORTH DEL REY GOLD MINING COMPANY.—Report for September: Produce and Cost: Produce, 4239 oits., at 8s. 6d. per oit., 1801*l.* 11s. 6d.; cost, 3747*l.* 12s. 4d.; loss, 1946*l.* 0s. 10d.—First Division of October: The force has latterly been attending regularly, and the works generally are progressing favourably, but the ores returned are still of a low standard. Sinking operations have been retarded for these last two weeks, on account of making preparations to receive the necessary pitwork in the incline for drainage, in consequence of the water following our deepest point yet excavated. We hope, however, to commence the first cross-cut for drainage in the coming month.

GENERAL BRAZILIAN.—As advised in the report for August, the operations in the shallow adits at Itabira and St. Anna were suspended on receipt of letters from the Rio agents, pending the raising of further capital by the issue of debenture stock. The successful issue of the debenture stock will have enabled the agents in Rio to renew the credits, when the driving of the adits will no doubt have been continued.

ANGLO-BRAZILIAN.—Report for September: Produce amounts to 986 oits. (or 113 oz. troy), showing a loss of 528*l.* 17s. 10d. We have had to contend against another dry month, the duty of the stamps working not exceeding 0·50 a ton per 24 hours.—First Division of October: We have, I trust, seen our lowest produce, rain having fallen in plenty. Every effort will be made to pull up for the past months by the additional six heads of Victoria stamps which can be kept employed for at the least three months with surplus stock of poor ore and rejected killas.

ROSSA GRANDE.—Report for September: The cost for the month, inclusive of 38*l.* 12s. 1d. spent at Gongo River, amounts to 827*l.*—First Division of October: The lode in the Bahu continues to open out very satisfactorily, whilst that in the Cachoeira is not at present looking so well as for some months past.

SAO VICENTE.—Extract from letter dated Oct. 16: At Brucutu mining operations are progressing much as usual.—Sao Vicente Proper: At Buracao the whole deposit shows gold in the "Batea" (not an old one), but this place is under suspension for the present in consequence of not having any means for treating the ore. The line at Morro das Almas is much the same as for some time. I expect to commence returning a little gold from here shortly now the rain has commenced. The large deposit of quartz is opening quite as well as I ever anticipated, and I have not the least doubt but this will eventually be a rich mine. The two stamps I have here—Dawson's and Morro das Almas—are quite enough as trial stamps while exploring, but they are utterly inadequate to our requirements if we wish to make regular returns.

BRAGANZA (Gold.)—Oct. 16: We are driving the level referred to in my last; it has been driven 4 fms. 3 ft. this month, and expect to complete it by the end of the month, unless there is an alteration in the ground.—[By the last mail from Rio de Janeiro the London and Brazilian Bank (Limited) receiving 127 ounces of gold dust on account of the Braganza Gold Mining Company (Limited).]

EMMA.—Telegram from Salt Lake City, Nov. 18: Forwarded no ore this week to New York; raissd 270 tons first-class ore this week; raised no second-class ore this week; 250 tons first-class ore at railway depôt; 320 tons first-class ore raised at mine; 330 tons sold here. Hoisting engine completed, will increase yield to 100 tons daily during the week; also raise rich ore from bottom. Mine in good working order.

COLORADO TERRIBLE LODE.—The 23d shipment of ore is daily expected to reach Liverpool, and the 24th is on the way to New York. The following prices have been obtained for the 21st shipment:—Lot 1: 7½ tons first-class ore, 89*l.* 2s. 9d. per ton.—Lot 2: 2½ tons "best" mineral dressed from the third-class ore, 62*l.* 19s. 11d. per ton. The mineral from third-class ore contained 71 per cent. of lead, for which 12*l.* 4s. was added to the value of the silver contents.—Monthly Statement: Ores raised during September: First-class, 6 tons, value per ton $400=$2400; second-class, 40 tons, value per ton $120=$4800; third-class, 80 tons, value per ton $30=$2400; 25 tons rock, value per ton $10=$250: total, $9850.—Month's Expenses: Management, $280; mining and labour, $5395·37; interest paid, title expenses, ore 1st class, and office sundries, $521·35; powder, fuse, and supplies, $351·33: total, $6548 05, leaving a balance of $3301·95.

I. X. L. (Gold and Silver).—Oct. 28: The grading for the engine-house is now finished, and two carpenters have gone to lay the sills, and when laid I shall send up four or five more, so that the building may be roofed without delay. I hope soon to get to sinking, which I shall push down to the 200 before I drive, and I have every reason for feeling assured that the result will be as I have ventured to predict. I have already informed you that when I made my survey, and in which I showed the lodes crossing each other at I, I had nothing to guide me but ontside indications, and, of course, my transit instrument. On opening up the old tunnel, shown a little below K (on plan), I found the crossing close to I, and near where I have commenced sinking.—[*Note by Secretary.*—The importance of this discovery is very great, as it proves that the cross-course indicated by surface outcroppings is clearly defined at depth, apparently proving that a large body of ore will be struck there. The shaft being already 85 ft. down there only remains 115 ft. to be done.]

CAMP FLOYD.—Telegram from Messrs. Wells, Fargo, and Co.:—"Wilder writes, 'Mill started 17th.—Water increased; mine same as before.'"

BATTLE MOUNTAIN.—Capt. Richards, Oct. 17: Virgin: In Pascoe's winze, being sunk below the 188 ft. drift, there is nothing new, it being without ore. The 113 ft. drift north yields no ore at present, but is being pushed forward; a winze is being put down on the ore that was discovered in this level, and so far as we have gone (about 15 ft.) the ore continues down, it being a superior quality. The 73 feet level north has greatly improved, yielding some good ore. The stopes back of the 113 and 73 feet levels are yielding about as usual.—Lake Superior: The 135 ft. drift south has been suspended owing to the shortness of hands. Richard's winze, sinking below the 135 feet level, is producing some stones of lead ore; this we do not consider a good sign in these mines, as we have often seen it displacing the copper, and it is of no value. We raised 880 sacks in two weeks.

— Capt. Richards, Oct. 31: Virgin: Pascoe's winze, below the 188, is for the present suspended. The 113 is being pushed forward, in expectation of other discoveries being made in this direction. Daniel's winze, sinking in the bottom of the 113, is producing some superior ore, but the lode is not so large as when last reported on. The 73 ft. drift north is still improving, and produces some very fine ore; this drift looks better than I have seen it for many months, and I am hoping it is the beginning of another and lasting body of ore; we shall prove this by continuing this level. Pierce's stope, in the back of the 113, is now worked north of Black's winze, all the ore ground between this winze and Truscott's having been taken away; the stope is producing good ore. Jack's stope, in the back of the 73, is now yielding a little ore. Jack's north is producing a fair quantity of good copper.—Lake Superior: Richard's winze, sinking below the 135, is still producing stones of lead, but no copper. Raised this week 360 sacks.

BENSBERG (Lead Mining and Smelting).—W. Hoffman, Nov. 16: We got no carbonate this week having put the men on to getting wash ore, so as to have a stock on hand for washing before the frost appears. The heavy snow which fell also made it difficult to distinguish the carbonate from other stuff, and we should have had a deal of rubbish among the carbonate had we attempted to get any. None of the shafts being in work we put the men on clearing fresh ground. There was not much done at the roof of the dressing-house this week, the snow being too deep on the ground. We built a powder-house at some distance from the workings, and a shed to store coal. Week's production of galena, 40 tons; average assay, 10 per cent. Week's production of wash ore, 50 tons; average assay, 15 per cent. Stock on hand ready for market, 20 tons; average assay, 45 per cent.

MENZENBERG (near Honnef, Germany).—The following are extracts of Capt. Roskilley's reports, dated Nov. 12 and 18:—"The sinking of Dickens's shaft is an important point, and it should be sunk with vigour, in order to explore at deeper levels Dickens's lode, the main lode, and also the lode cut in the reservoir, for, judging from the character and appearance which these lodes present only a few feet below the surface, and at the 16 fm. level, which produces some splendid stones of copper ore, I am fully persuaded when depth is attained they will be found rich in copper, as such large and masterly lodes cannot fail to be productive. We have also six men cutting through the lode at the 16 fm. level, in order to ascertain its size and probable direction, as at this point neither is the size or course exactly known; and seeing the very promising appearance it has here, and yielding some beautiful stones of red oxide of copper, we think that cutting through the same is necessary. In the south part of this concession the adit level is driven north of the valley into the hill 10 fms., in which driving the lode is only developed for about 30 fathoms; the last 33 fms. are driven altogether in the country, leaving the lode standing in the western side of the level entirely, but about 23 fms. behind this end a cross-cut is driven west 6½ fms., and cut the lode in about 2 fms. driving. The lode here is 5 ft. wide, a very promising-looking lode indeed, and which throughout its development has varied in width from 2 to 10 ft., and for the whole of the distance opened upon has a very promising appearance; therefore, I would recommend the driving of this cross-cut further north for the following reasons:—

1.—To intersect the lode upon which you have already developed 30 fathoms, and this has not been seen nor opened upon for the last 23 fms. driving; and, judging from the kindly appearance it shows in the cross-cut 23 fms. behind the end, I consider its intersection important, and when reached will give much greater backs than the point at which it is cut through, and its fine masterly character demands to be further explored.

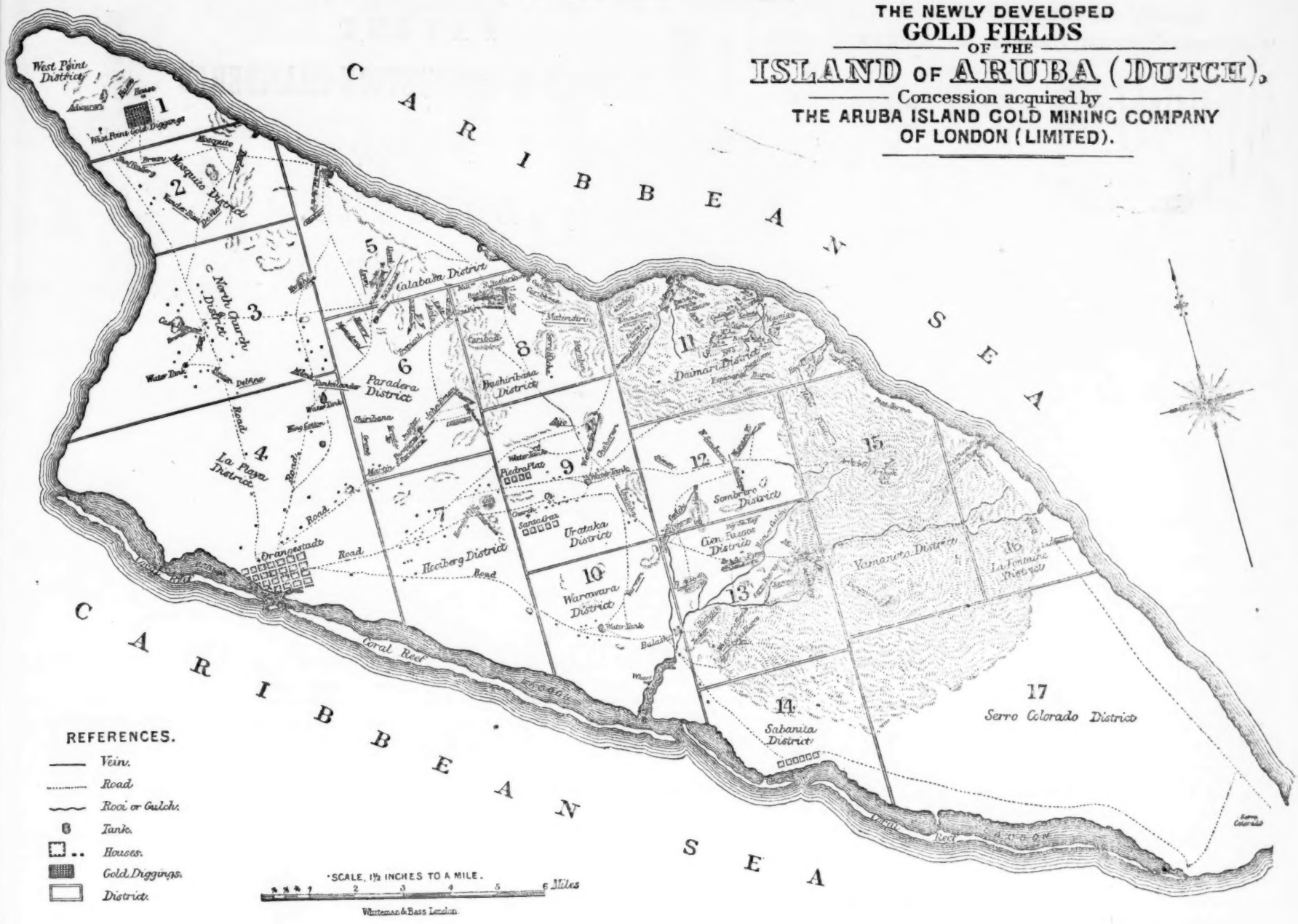
2.—To continue the driving of this cross-cut north, in order to intersect a large lode which can be seen at surface, or rather in the side of the hill, immediately under the Basalt Tuffa dyke, and the meeting of which at this point will give a back of at least 40 fms. This is an important feature, seeing that the adjoining mine, St. Josephberg, made immense returns of copper ore at and above this level (the 40); and, moreover, wherever the lode came in contact with the above dyke it made its richest deposits of copper ore; therefore, there is every reason to expect a similar result here. The character of the lodes and Basalt Tuffa dyke are identical with St. Josephberg. The concession is a very large one, and in which there are a great many lodes traversing both north and south and east and west, consisting of copper, lead, manganese, and iron.

The geological formation is that of a beautiful clay-slate or killas, traversed by a very congenial basalt tuffa dyke, in and about which lodes in this locality make rich in minerals. In conclusion, I would remark that taking into consideration the favourable importance of meeting with the lodes in the Basalt Tuffa dyke, together with the immense profitable returns which have been realised in the adjacent mines, St. Josephberg, Marienberg, Heter Fritz, and others, speak most encouragingly for the productiveness of the lodes in depth in this mine (Menzenberg), which is only required to open up for you a valuable and profitable property." On the 18th he writes as follows:—"Capt. Chegwin (Messrs. Taylor and Sons' agent) called to see me yesterday, whom I knew in England. I gave him an invitation to visit the Menzenberg Mine, to which he readily assented, hearing that we had some very fine lodes. I showed him the lode in the Reservoir, and also the stuff which came from Dickens's lode, and he expressed himself by saying that such beautiful lode and stuff as we have so near the surface, and producing splendid stones of copper ore, a stone of which he took with him, he had not seen before, and he only wished that he was in the possession of another such fine property, for if a rich mine be not found here in depth it is useless to search for mineral after the indications presented so near the surface. I was very pleased to hear him say so, for it corroborated my own statement.—R. R. ROSKILLEY."

WEST CANADA.—Oct. 22: At the Wellington Mine the stope in the bottom of the 40, east of Rowe's shaft, will yield 2¾ tons of ore per fm.—Huron Copper Bay: In Bray's shaft, sinking under the 60, the lode continues to yield 2 tons per fm. In Bartle's winze, sinking under the 60, east of Bray's, the lode will yield 2 tons per fm. The stope in the 60, east of Bray's shaft, will yield 3½ tons per fm. The stope in the bottom of the 50, west of Palmer's shaft, will yield 2½ tons per fm., and one in the bottom of the 35, west of the same shaft, will yield 3½ tons per fm. Two stopes in the bottom of the 35, east of Bray's shaft, are yielding 2¼ and 3 tons per fm. respectively. In the 35, west of Bray's, on Fire lode, there is a stope yielding 2 tons per fm.; and in the bottom of the 20, east of new engine-shaft, there is also a stope yielding 2 tons of ore per fathom.

[For remainder of Foreign Mines see to-day's Journal.]

QUICKSILVER AND AMALGAM SAVING APPARATUS.—The new invention of Mr. Joseph Potts, Treasure Hill, White Pine, Nevada, is called an Electro-Galvanic Quicksilver and Amalgam Saving Apparatus, and it is intended for that purpose in mining operations, more especially to save that portion which usually escapes down the sluices on account of its fineness or state of minute subdivision. This is accomplished by passing the pulp, or tailings, through a sluice, or section of a sluice, which is provided with peculiarly arranged riffles, the pulp, or tailings, being first distributed upon the floor, or bottom, of the sluice-box by means of a revolving hopper of novel construction. The riffles are made of copper, and rivetted to the bottom of the box at an angle of 30°, and extend lengthwise of the box. A space of about 1 inch is left between the riffles in each row, of which there are 10. The riffles in each alternate row are rivetted between the spaces of the upper row, so that there are five rows containing five such riffles, and five rows containing but four. In another box are another series of riffles, which run across the box, and are set at the same inclination as the box itself. On the upper side these riffles are separated so as to allow the quicksilver and soft amalgam to pass through and finally run into the vessel for receiving it. The lowest riffle is not perforated, and the main quantity of water and sand is allowed to pass over it into the sluice below. The boxes, riffles, &c., are all coated with amalgam, and the copper boxes are enclosed in others of zinc. So, in the admission of tailings or water, however slightly acidulated, a galvanic action is set up. The whole apparatus may be enclosed in a box and kept under lock and key. The apparatus receives the tailings at the upper end in a hopper or revolving wheel. The tailings are thus distributed along the course of the riffles, and finally discharged from the sluice. In passing through these boxes and over the riffles the tailings are subjected to a galvanic action, which adds intensity to the volume, and favours the amalgamation of the particles. The whole apparatus is charged with an additional current of electricity by ordinary batteries.—*Mining and Scientific Press* (San Francisco).



THE NEWLY DEVELOPED GOLD FIELD.

The Island of Aruba, a possession of the Government of Holland, is one of the Dutch Antilles, forming part of the colony of Curaçao, 42 miles from Curaçao, and is about 30 miles in length, with an average width of 7 miles. Upon this island gold was discovered in the years 1824 and 1825, and the mines were worked in a very superficial way until the year 1838. The only method pursued was by simply washing the dirt and seeking after free gold, which the rain washed down from the hill sides. In this rude way large quantities of free gold were obtained. One nugget of 44 lbs. is now to be seen at the Museum at Leyden, Holland. After the year 1838 free right to mine upon the island was given to the natives. In some places they sunk pits upon the veins, procuring therefrom only the gold visible to the eye, which was found in pockets or strings running through the rock. The veins were worked with great profit, but as depth was attained, about the year 1854, and having at their command only the rudest facilities, they were obliged to abandon their work. From 1855 to 1867 but very little mining was done upon the island except by the natives in a very small way, but one gentleman certifies that there was bought from the natives at various times during that period 10,000 ozs. of gold. In December, 1867, the Colonial Government of Curaçoa granted to Francisco Isola the sole and exclusive right to mine upon the Island of Aruba for the term of 25 years. This time was afterwards by official decree increased to 35 years. This concession has been acquired by the *Aruba Island Gold Mining Company of London (Limited)*, registered in July last, and now carrying on business at Gresham House, Old Broad-street.

The town and harbour of Orangestadt are situated upon the leeward side of the island. The harbour is formed by a coral reef. Vessels of 15 ft. draught can pass over the reef at all times. Once inside there is water sufficient to float vessels of the largest size with perfect safety. The population of the island may be stated at about 4200, consisting of Government officials, merchants, labourers, and their families. The natives live by mining, agriculture, and fishing; they are a most industrious race, quiet, peaceable, obedient, and very easy of control. The climate is at all times healthy, which may be accounted for by the fine, strong breeze which is constantly blowing from E.N.E. The temperature varies but very little. The rate of mortality is extremely low. The island has never been visited by any violent disease, such as cholera, yellow fever, or small-pox. Wood can be had from Venezuela, 14 miles distant. Coal has recently been found near Coro, a town on the main land about 50 miles from Aruba.

Out of the 4185 inhabitants upon the island there are 600 able-bodied men, who may be employed as miners and labourers, and as many more as are required can be brought from Curaçao or Bonaire—a distance not exceeding 100 miles—by paying the expense of transporting them, and 1 fl. (20d.) per day wages. These men are strong, active, and above the average height; they are fine workers, and can labour all day in the scorching sun without being affected; they are very intelligent, and rapidly learn anything that is carefully shown to them. Three years ago no systematic mining had been done—not a hole had been blasted on the island. Since then the natives have become quite efficient workmen, and they make first-rate miners. It is only necessary to have a few skilled miners to take command of them.

The predominating rock upon the island is syenite, which occurs in all stages of decomposition. Clay-slate, both solid and shaly, occurs upon the island. There is also porphyretic rock, syenite rich in hornblende, dioritic slate, diorite, and granite, in which occur large quantities of gold-bearing quartz. Already 200 *veins have been discovered*, and it seems only reasonable to suppose that many more are concealed by the alluvium, composed of loose rock and soil, which has been washed from the mountains above. The ore consists of quartz, varying from the purest white to the darkest red in colour, containing iron pyrites almost without any exception; it also contains copper pyrites, oxide of copper, carbonate of copper, magnetic iron, &c., in variable proportions. It is usually solid, but in some veins rock full of cavities and honeycomb quartz is found.

Districts.—The island is subdivided into 17 districts, as follows:—

1.—West Point.	7.—Hooiberg.	13.—Cien Fuegos.
2.—Mosquito.	8.—Bushiribana.	14.—Sabanita.
3.—North Church.	9.—Urataka.	15.—Yamanota.
4.—La Playa.	10.—Warawara.	16.—La Fontaine.
5.—Calabasa.	11.—Damari.	17.—Serro Colorado.
6.—Paradero.	12.—Sombrero.	

The *West Point District* contains a large number of veins, 18 of which have been examined and reported on. Many years since the natives obtained large quantities of gold from these mines, and only abandoned them when forced to do so by the accumulation of water. The best evidence of their past riches—and there is no reason why they should not be rich in future—is the enormous amount of work done 20 years ago. There are thousands of tons of vein rock piled up in enormous heaps around and upon the veins.

Some of the shafts were from 30 to 40 ft. square, made that size so that the men could follow the dip of the vein, without having to work under overhanging rock, not having any timber to support the sides and keep the rock from falling in. The deepest shaft is on the Tabushi vein, and is stated to have been when the mines were abandoned 62 ft. in depth. The present company are now sinking a shaft at a point which will drain the entire old diggings: it is to be supplied with pumps and machinery sufficient to drain them. This being done, it will be easy to continue their working.

But the principal operation of the new company will be confined to the *Bushiribana District*. This district contains 18 mines, of which the *Kadushi* is at present the most important, and one of the best on the island. It is about six miles from town, and half-a-mile from the north-east shore. The vein, which averages 5 ft. in width, consists of white quartz, and some coloured red by decomposed iron; it frequently showing free gold; it also contains iron pyrites and a little carbonate of copper. It is solid, and requires blasting to be worked properly; it has two beautiful walls, upon both of which is a talcose clay. The country rock is syenite, tolerably firm. The vein is nearly perpendicular, dipping only slightly to the south. There is one large open-cut, 90 ft. long and from 20 to 30 ft. deep, upon this vein; there are also two shafts, each 35 ft. from the surface, or a little below the bottom of the open-cut. The vein has been laid open for a length of 400 ft. upon the surface, and has been traced by croppings considerably further. The very whitest rock in this vein gives a good colour of gold, and 10 tons of ore, tested by Fred. Claudet, assayer to the Bank of England, yielded about eight guineas per ton.

The *Bushiribana* vein is about a quarter of a mile to the east, and nearer the shore than the last, situated only a very few feet above the sea. There is one large and several small open-cuts on the vein, which averages 2 ft. in width, dipping a little to the south; it has extremely regular walls of diorite, and has been traced for upwards of a mile.

The *North Bushiribana* vein is only about 50 ft. to the north of the last, and runs parallel with it. There is one shaft 32 ft. deep on this vein, still sinking, and well timbered, in the bottom of which the vein is 5 ft. wide, but rather broken up, consisting of strings of quartz mixed with greenstone, but on the surface the vein is more solid and regular. There is also a large open-cut 92 ft. long. This vein is also in diorite, and is nearly perpendicular; it has been traced for about 400 ft.

The *Lampe* vein crosses the Bushiribana vein close to the open-cut, and at the point of intersection is a shaft. There are two other shafts in the vein about 16 ft. deep, in both of which the vein is rather broken up, but there are 2 ft. of solid quartz. The appearance of this vein is very good, and will probably become more solid below.

There are other five new veins, all close together, and situated from 50 to 200 yards south-east of Kadushi. They all show croppings, but upon none has any work been done.

The *Little Ikey* is a large mass of quartz near the Bushiribana and Lampe veins.

The *Serro Hacha* is an extremely promising little vein, but it has been traced for only a short distance; it is solid, 2 ft. wide, with very regular walls. The quartz looks very favourable, and free gold is frequently visible in the rock.

The *Matividiri* is one of the largest veins upon the island, and as it runs up the side of the mountain for a great distance it can be economically worked. It is the intention of the company to drive on the vein from the lowest point at which the croppings are traced, and thus work it with great advantage. The vein is traced for quite 1000 ft., and from the croppings at the surface it is 20 ft. wide or more.

The *Matibin* vein is stated to be small but rich, and there is one small shaft upon it.

The *Caribbean* is a new vein lately discovered upon the Matividiri Mountain, which is promising, but small.

The *Gato* vein is situated on the north side of the Matividiri Mountain, close to the sea shore, but some way up the side of the mountain. It is a fine, bold vein, and at least 5 ft. wide: in one place the croppings stand up 6 ft. above the surface.

The *Peters* is a new vein, intersecting the last, and is a fine bold one.

At *Tras Muralla* there is a very large quantity of loose quartz, apparently coming from several small veins, which may make one solid vein in depth. The quartz looks very favourable. It is situated about 500 yards south of Kadushi.

The *Corobodi* vein is half-way between Bushiribana and Paradero, and appears to be rich. There are three open cuts on it, one of which is 12 ft. deep. It has been traced for 500 ft.

The ores from this district, as shown by certificate of Fred. Claudet, assayer to the Bank of England, yielded from 4*l.* to 20*l.* per ton, which decided the company to confine its principal operations to it. The present management has been but little over three months in possession, during which time a road has been constructed from the town of Orangestadt to the Bushiribana district. A large machine-shop, blacksmiths' shop, dwellings, offices, &c., are nearly completed. Four shafts are going down upon the Kadushi vein, of which vein the superintendent writes—"Kadushi is looking wonderfully well, and I fully believe that this mine alone, when fully developed, will be of more value than you have paid for the whole concession of the island."

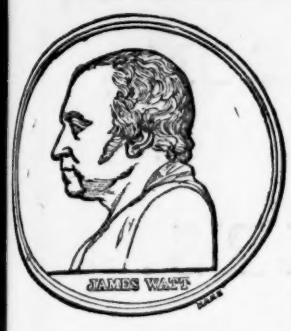
Over 100 tons of ore have been taken from the Matividiri Mine, and preparations made for driving a tunnel upon this vein. Other important veins are being developed. Over 20,000 tons of ore are now mined upon the island ready for reduction. Mining supplies of all kinds sufficient for a large force of miners for one year, 200,000 ft. of lumber for timbering the shafts, Blake's crushers, stamps, concentrators, amalgamators, and other machinery have been purchased and forwarded to the island, and experts of large experience have been secured for putting up and running the same. It is expected that the machinery will be in working order during the month of January next. The site for the erection of the machinery and buildings has been chosen near the Kadushi vein, in close proximity to the sea, at a point that can be easily reached by tramway or otherwise from every mine in the district.

The Gulches.—During the time the mines were worked a very large quantity of gold was taken from the valleys, gulches, or rooís, as the residents and officials in the island certify. Every rooi or gulch but one upon the island has been worked, and it is stated with success. The gold was separated in a very rude manner from the fine dirt; it was either carried to the sea or to some water, and washed in large bowls, or to some place exposed to the wind, and there treated by a winnowing process. These gulches are now to be worked upon the Californian plan, by the introduction of water.

An eminent engineer, sent from London to examine the mines prior to this company completing the purchase, says:—"I believe that on the island of Aruba there are more gold quartz veins than are known to exist in any other place of the same size."

"The accessibility of the Island of Aruba by water,—the fact that there will be little or no land carriage for the machinery, fuel, and other supplies, as well as ore and bullion,—the honest and peaceable character of the inhabitants, and their complete control by the Government officials, the extraordinarily low price and quality of the native labour,—the general salubrity of the climate,—are all circumstances which must be taken into consideration in forming an estimate of the value of the concessions to be acquired by the "Aruba Island Gold Mining Company."

BURLEIGH ROCK DRILLING MACHINERY.



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THE BEST & ONLY PRACTICAL DRILL.

IT DOES NOT GET OUT OF ORDER.

PROGRESSES through Aberdeen granite at the incredible rate of 10 inches per minute.

SAVES £5 a day as compared with hand labour, independent of the enormous saving effected in the general expense, such as PUMPING, VENTILATION, INTEREST OF CAPITAL, &c., from the fact of the "put out" being increased four-fold.

DRILL POINTS.—The saving in steel alone is considerable. One drill will go through 20 feet of Aberdeen granite without sharpening.

Machine and Stand for Quarrying and Sinking.

PRIZE MEDALS:

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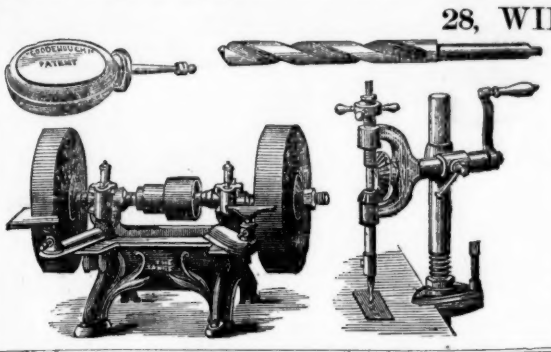

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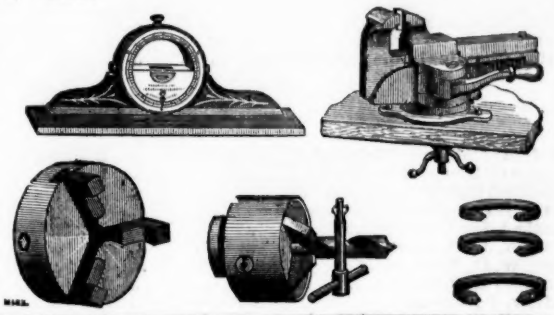

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DOGS OUT OF CONDITION ARE PROMPTLY RESTORED by the use of NALDIRE'S POWDERS, which remove worms, give tone to the stomach, and produce first-rate condition.
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PATENT STEAM EARTH-BORING MACHINES
FOR
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Capable of BORING HOLES from 6 to 36 in. diameter, and to any depth to 2000 ft.

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THE DON ECONOMIC LUBRICATING OIL
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ECONOMIC LUBRICATING — THE DON — OIL.

MR. ALFRED HEWLETT, of the Wigan Coal and Iron Company, says:—"I have used it for two years, and find it to answer exceedingly well for lubricating purposes."

MR. NASMYTH, the Inventor of the Steam-Hammer, says:—"I am highly pleased with it as a most effective and durable lubricant, having remarkable properties in the way of setting free bearings which had got set fast."

In face of these and hundreds of other letters to the same effect, it is a MERE WASTE OF MONEY to use the dearer kinds for the engines and machinery of collieries and mines, numbers of which are now using the Don Oil instead.
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Circulars containing particulars sent on application.
PRICE—By the Ton of 253 Gallons, 2s. 6d. a gallon; by the Cask of 40 Gallons, 2s. 9d.

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CHAS. PRICE AND CO.'S RANGOON ENGINE OIL,
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THIS OIL is suitable to every kind of Machinery. As a lubricant it is equal to the best Sperm or Lard Oil, while it possesses the great advantage of being entirely free from any principle which wil corrode the metal bearings.
For particular kinds of Machinery, the Oil may be specially prepared of a consistency and character adapted to the nature of the work to be done.

"Chemical Laboratory, 7, Printing House-square, Blackfriars, April, 1869.
"I herewith certify that the Rangoon Engine Oil, manufactured by Messrs. Chas. Price and Co., is free from any material which can produce corrosion of the metal work of machinery. It is indeed calculated to protect metallic surfaces from oxidation.
"The lubricating power of this oil is equal to Sperm or Lard Oil.
"T. W. KEATES, F.C.S., &c. &c.

Every parcel of the Oil sent from the work bears the Trade Mark of the Firm.
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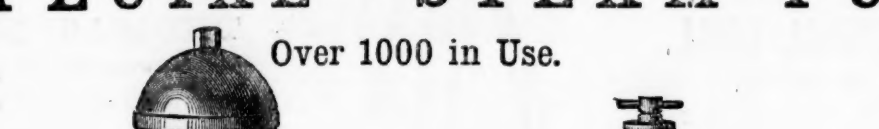
Over 1000 in Use.



IN USE AT THE FOLLOWING QUARRIES:—

Carnarvon and Bangor Slate Co. ...	5	Pumps.
Kellow, J. E., North Wales Slate Co...	1	„
New Zealand Quartz Crushing and Gold Mining Company...	1	„
Scott, R W., Dungannon, Ireland ...	1	„
Foster, J. S., Hebburn Quarries ...	1	„

IN USE AT THE FOLLOWING CHEMICAL WORKS:—

Alum and Ammonia Co., Bow Common	2	Pumps.
Barnes, W. C., Hackney Wick... ...	2	„
Burt, Boulton, and Hayward, Tar Works, Millwall	1	„
Cory and Co., Manor-street, Old Kent-road	2	„
Whiffen, Thomas, Battersea	1	„
Jones, W., and Co., Middlesborough...	4	„
Jarrow Chemical Co., South Shields..	1	„
Richardson, J. G. and N. H., Jarrow-on-Tyne	1	„
Read, Holliday, & Sons, Huddersfield	1	„
Sheldon, Nixon, and Co., West Jarrow	2	„
Tennant, C., and Co., near Newcastle.	7	„
Webb, H., & Co. (Manure), Worcester	1	„
Union Chemical Company, Stratford..	1	„

NOTE.

Requires NO Shafting, Gearing, Riggers, or Belts.

All Double-Acting:

Works at any Speed, and any Pressure of Steam.

Will Force to any Height.

Delivers a constant stream.

Can be placed any distance away from a Boiler.

Occupies little space.

Simple. Durable, Economical.

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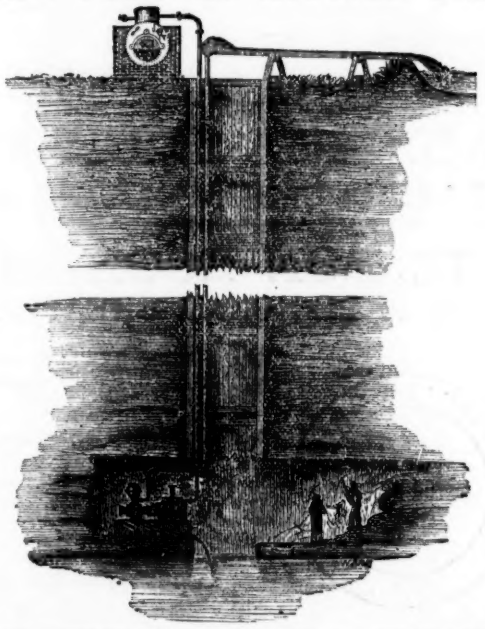
Adelaide Colliery. Bishop Auckland	3	Pumps.	Acomb Colliery, Hexham	1	„	Blackfell Colliery, Gateshead	1	„	Black Boy Colliery, Gateshead	1	„	Castle Eden Colliery	2	„	Crofton, J. Ct., near Ferryhill	1	„	Carr, W. C., Newcastle	4	„	Etherley Colliery	1	„	Gidlow, T., Wigan	3	„	Haswell, Shotton, and Easington Coal Co. ...	2	„	Lochgelly Iron and Coal Company	1	„	Leather, J. T., near Leeds	2	„	Lumley Colliery, Fence Houses	1	„	Monkwearmouth Colliery, Sunderland... ...	1	„	North Bitchburn Colliery, Darlington	2	Pumps.	Newton Cap Colliery, Darlington...	1	„	Normanby Mines	1	„	Oakenshaw Colliery	1	„	Pease's West Colliery	2	„	Pease, J. and J. W., near Crook	5	„	Pease, J. and J., Brandon Colliery	1	„	Pegswood Colliery, near Morpeth	2	„	Pelton Fell Colliery	1	„	Railey Fell Colliery, Darlington	1	„	Right Hon. Earl Durham, Fence Houses ...	1	„	Skelton Mines	1	„	South Benwell Colliery	4	„	St. Helens (Tindale) Colliery	1	„	Stott, James, and Co., Burslem	1	Pumps	Seaton Delaval Coal Company, near Newcastle	1	„	Thornley Colliery, Ferryhill	1	„	Thompson, John, Gateshead	2	„	Trimdon Grange Colliery	1	„	Tudhoe Colliery	4	„	Vobster and Mells Colliery	2	„	Widdrington Colliery, Morpeth	2	„	Whitworth and Spennymoor Colliery	3	„	Westerton Colliery, Bishop Auckland	1	„	Wardley Colliery, Gateshead	1	„	Westminster Brymbo Coal Company	2	„	Weardale Coal and Iron Company	5	„

IRONWORKS AND ROLLING MILLS:—

Bede Metal Company, Jarrow	11	Pumps.	Gilkes, Wilson, Pease, and Co , Middlesboro'..	2	Pumps.	Whitwell and Co., Stockton	3	Pumps	
Bagnall, C. and T., Grosmont Ironworks ...	2	„	Lloyd and Co., Middlesborough	1	„	Whessoe Ironworks, Darlington	1	„	
Consett Ironworks	2	„	Solway Hematite Iron Company, Maryport ...	1	„	West Cumberland Hematite Iron Company ...	1	„	
Castleford Foundry Company, Normanton ...	1	„	Vaughan, Thomas, Middlesborough	2	„	Westbury Iron Company	1	„	
Ellen Rolling Mills, Maryport	1	„	The Shotts Iron Company, Edinburgh	1	„				

THE "SPECIAL" STEAM PUMP AS APPLIED FOR DRAINING MINES.



The arrangement in the accompanying illustration shows an economical method of draining mines without the expense of erecting surface-engines, fixing pump-rods, or other gearing. A boiler adjacent to the pit's mouth is all that is necessary on the surface; from thence steam may readily be taken down, by means of a felted steam-pipe, to connect the pump with the boiler. The pump may be placed in any situation that may be convenient for working it, and connecting the steam, suction, and delivery pipes.

These engines can be fixed and set to work in a comparatively short time, and also at a very small outlay. They are used in large mines as auxiliary engines, and will be found invaluable adjuncts in all mining operations.

To estimate the quantity of water to be raised by any given size of pump refer to the tabulated list below. It is recommended to use long-stroke pumps where the height exceeds 100 ft., so that the largest result may be obtained with a minimum wear and tear of the pump pistons and valves. The pumps are provided with doors for ready access to all working parts.

PRICES OF THE "SPECIAL" STEAM PUMPS.

Diameter of Steam Cylinder .....inches	2½	3	4	4	6	6	6	7	7	7	8	8	8	8	10	10	12	12	14	16	26
Diameter of Water Cylinder .....inches	1¼	1½	2	4	3	4	6	5	6	7	4	6	7	8	6	7	8	10	8	7	6½
Length of Stroke .....inches	6	9	9	12	12	12	12	12	12	12	12	12	12	18	12	12	18	24	48	24	72
Strokes per minute	100	100	70	50	50	50	50	50	50	50	50	50	50	35	50	50	35	—	—	—	—
Gallons per hour	310	680	815	3250	1830	3250	7330	5070	7330	9750	3250	7330	9750	13,000	7330	9750	13,000	—	—	—	—
PRICE.....	£10	£15	£20	£35	£30	£40	£47 10	£50	£52 10	£57 10	£50	£55	£65	£85	£70	£80	£100	—	—	—	—

IF BRASS LINED, OR SOLID BRASS OR GUN-METAL WATER CYLINDERS, WITH COPPER AIR VESSELS, EXTRA, ACCORDING TO SIZE.

Any Combination can be made between the Steam and Water Cylinders, provided the Lengths of Stroke are the same, thus—8 in. Steam and 3 in. Water, or 10 in. Steam and 3 in. Water, adapted to height of lift and pressure of steam, and so on.

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